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VOLUME 125, No. 8 AUGUST 21, 1947

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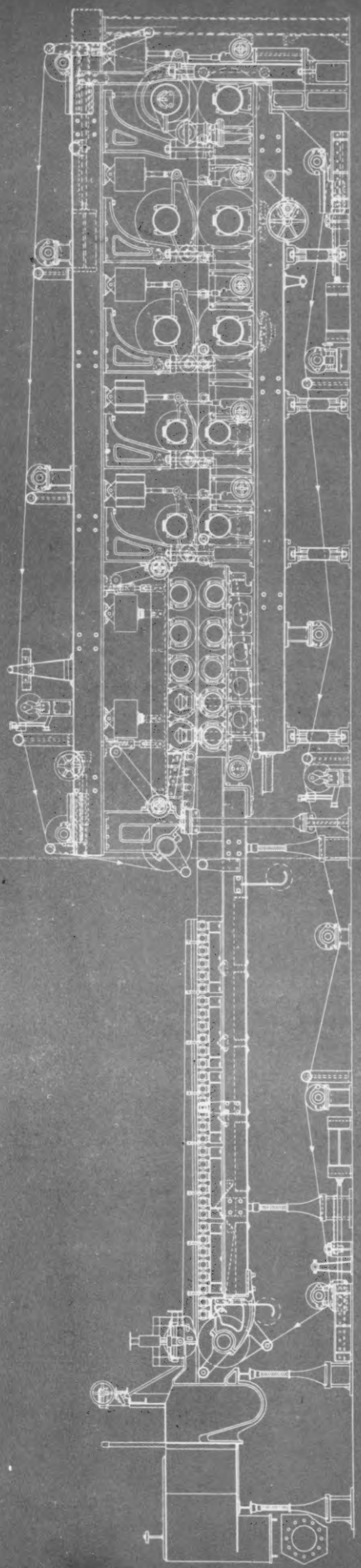

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CALENDAR OF COMING EVENTS

August 25, 1947—National Paper Trade Association of the U. S., Inc., Midwest Regional Meeting, Hotel Sherman, Chicago.

September 3-5, 1947—TAPPI Fundamental Research Meeting, Appleton, Wis.

September 25-26, 1947—TAPPI Plastics Meeting, New State College of Forestry, Syracuse, N. Y.

October 4-6, 1947—National Association of Waste Material Dealers, Inc. Fall Convention, Hotel Ritz-Carlton, Atlantic City, N. J.

October 9-11, 1947—TAPPI Alkaline Pulping and Chemical Products Meeting, Asheville, N. C.

October 23-24, 1947—TAPPI Fibrous Agricultural Residues Meeting, Alton, Ill.

October 27-29, 1947—The National Paper Trade Association of the U. S., Inc., Semi-annual Convention, Hotel Sherman, Chicago.

November 3-5, 1947—TAPPI Second Engineering Conference, Philadelphia, Pa.

May 18-20, 1948—American Pulp and Paper Mill Superintendents Association, Annual Meeting, Roosevelt Hotel, New Orleans, La.

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Stops Gelling
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Paper TRADE JOURNAL
REG. U. S. PAT. OFF.
VOL. 125, NO. 8 AUGUST 21, 1947

Canada to Welcome Newsprint Seekers

MONTREAL—United States legislators are going hunting this fall—for newsprint.

The House of Representatives newsprint investigating committee, headed by Representative Clarence J. Brown, is said ready to visit Canadian and Southern United States mills starting about mid-September. Senator Homer Capehart, chairman of the Senate small-business subcommittee, expects to lead a party to Alaska.

From the long-term standpoint these trips along with other Congressional activities in the newsprint field are likely to have a decided impact on the Canadian industry over the next five years, it is believed.

Following Rep. Brown's reported plans to visit Canadian mills, R. M. Fowler, president of the Newsprint Association of Canada, wired him in part, as follows:

"I see by today's newspapers that you and your committee may visit Canada in the near future. On behalf of the newsprint industry of Canada may I warmly urge you to do so. . . . We feel sure that a visit will lead to a better understanding between Canada's great newsprint industry and your own country. . . ."

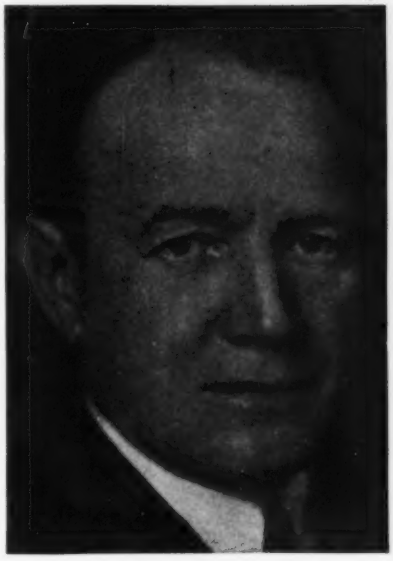
The proposed trips follow months of intensive work by both House and Senate committees in an attempt to get more newsprint for United States publishers. In a report prepared by Representative Brown's committee it was stated that the U. S. produced 770,890 tons of newsprint in 1946. This has since been increased by 450,000 tons with a strong possibility that some 200,000 tons additional may be provided in the next few months. This latter is not expected to be available until late 1948 or early 1949.

Bankers Work Toward Florida Newsprint

ORLANDO, Fla. — The Florida Bankers' Association, of which Alfred A. McKethan is president, urging the establishment of a newsprint mill in the State, has adopted a seven-point program designed to create a public awareness of the importance of forests.

George G. Ware, president of the First National Bank of Leesburg, is chairman of the association's forestry committee.

Consolidated Joins In New Power Dam Project



GEORGE W. MEAD

Mechanicville Mill Ready For Westvaco Visitors

NEW YORK — To familiarize office workers of West Virginia Pulp and Paper Company with the firm's operations, plans have been made for two tours of the company's Mechanicville, N. Y., plant on August 28 and September 11. Fifty persons from the New York office will make the first visit and 67 will take the second trip in September.

The office workers will go to Mechanicville in special sleeping cars, arriving in the early morning. Breakfast will be served at the Schuyler House in Mechanicville.

Special guides have been appointed to conduct the New York office employees on their tours of the plant and to explain details of the plant operation. For a vast majority of the office workers the tour will be their first opportunity to see a mill in operation.

Shortly after noon on each visiting day Plant Manager Thomas H. Stirling and his staff will be hosts to the New Yorkers at a clam steam at the Mechanicville Golf Club.

WISCONSIN RAPIDS, Wis. — George W. Mead, president of the Consolidated Water Power and Paper Company and president of the newly-organized Wisconsin River Power Company, on Thursday, August 14, declares that construction will be started immediately on a new dam and hydroelectric plant on the Wisconsin river, at Petenwell Rock, near Necedah, Wis.

Consolidated will be joined in the project, estimated to cost $8 million and scheduled to be completed in 1949, by the Wisconsin Power and Light Company and the Wisconsin Public Service Corporation, and each will take a third of the power generated.

The dam will be second in generating capacity, to the Prairie du Sac hydro plant and will form an artificial lake fifteen miles long and about two miles wide. It will be located in Juneau and Adams counties, with its northern tip extending to the Wood county line.

Consolidated for some years has owned the site at Petenwell Rock, from which the dam will take its name. Financing has been arranged through the Northwestern Mutual Life Insurance Company.

Beside President Mead, officers of the new Wisconsin River Power Company are: William F. Thiele, Consolidated's chief engineer, executive vice-president, and Ralph R. Cole, secretary-treasurer. Cole also is secretary-treasurer of Consolidated.

Directors in addition to Mead and Thiele are: C. E. Kohlhepp, Milwaukee, vice-president and general manager of Wisconsin Public Service Corporation; A. G. Carson, Madison, vice-president and chief engineer, Wisconsin Public Service Corporation; Grover C. Neff, Madison, president, Wisconsin Power and Light Company; and R. G. Walter, Madison, vice-president in charge of operations, Wisconsin Power and Light Company.

The Petenwell dam project will be part of a master plan in the development of the Wisconsin river which has been fostered since 1907 by the Wisconsin Valley Improvement Company, of which Mead also is president. Wisconsin Valley is made up of paper and power concerns.

Directing construction of the dam

(Continued on page 18)

Air Surveys Located New Continental Site

BUFFALO, N. Y. — Continental Can Company, Inc., second largest container manufacturer in the world, surveyed the Niagara Frontier from the air before selecting a 36-acre site at Colcin Ave. and Brighton Rd., Town of Tonawanda, for its new $2 million factory to make fiber drums.

By using an airplane to pick out a suitable location, company representatives were able to get a quick view of the railroad facilities, the pattern of highways, the flow of vehicle traffic, and study the proximity to housing areas.

Two or three sites in the Tonawanda area met the company's requirements, as a result of the air survey, and realty agents were instructed at once to make inquiries. The other sites were eliminated because of certain restrictions that were part of the deeds involved.

The new Tonawanda plant, to be a low, spreading building, will make fiber cartons of 5 to 75 gallons capacity, for which there is a wide market in this area. This type of container is widely used for the packaging of powders and chemicals produced in the many chemical plants in Buffalo and Niagara Falls.

Factors that influenced the selection of the site were its remoteness from smoke and soot of other industrial sections, and the quietness and general cleanliness of the area.

This will be a model plant, with cleanliness in operation especially stressed, as many of the containers made there will be used for pharmaceuticals, and some food products. The plant will be attractively landscaped and a large parking lot will be included. Other factors were the good labor supply in the area, good railroad service.

Contracts for the acquisition of the site from Elmlawn Cemetery, which holds title to the property in the name of the Buffalo Burial Park Association, are now being drawn up. Continental, it is understood, has agreed to pay approximately $60,000 for the parcel.

Included will be a portion of the old right of way of the International Railway's high-speed line, 80 feet wide and about 1500 feet long. By purchasing this strip Continental will have ownership of property alongside the Erie Railroad's Niagara Falls line to provide switching and loading facilities.

Walter Kidde, Inc., New York architectural and engineering firm, has been given the green light. The contract for structural steel work has been let and it is expected ground will be broken in a few weeks. The plant is expected to be completed about a year from now.

Actual cost of the building will run around $1,000,000, although final figures, the company said, have not been prepared. Machinery and other appurtenances are expected to amount to another $1,000,000.

The new plant, which will employ 400 persons initially, will augment the company's production of fibre containers now made at its plant at Van Wert, O., and Reading, Pa., but the output here is not expected to exceed production at Van Wert, the company's largest plant in its Paper Products Division.

Thilmany to Install New Paper Machine

KAUKAUNA, Wis. — Thilmany Pulp and Paper Company is making plans to install a No. 10 machine soon in order to expand its manufacturing program. Its expansion program has been underway for some time.

A new garage is being built at mill No. 1. It will be used for pulp and storage for an indefinite period, and for garage purposes later. It will be 45 by 165 feet. The estimated cost is $40,000.

At mill No. 2, a pulp storage warehouse is being erected. It will be 40 by 120 feet and will be of steel and concrete construction. The present inventory of pulpwood is a large one.

Thilmany has added a 40-ton diesel electric crane to its equipment. It has a one and one-half yard capacity, an equivalent of 1,300 tons of paper with each load. The boom rears itself 65 feet into the air. The crane is termed ultra-modern. Operators are being trained to operate the machine, which is expected to double the production of the previous equipment, a 20-ton steam machine.

Port Arthur and Soo Share Woods Workers

TORONTO—Labor Minister Mitchell disclosed last week the completion of arrangements for the employment of 725 woods workers from displaced persons' camps in Germany, who arrived in Halifax Thursday. About half of the men who volunteered to come to Canada to help meet the shortage of woods workers here, will be employed in the Port Arthur district, according to Mr. Mitchell. The remainder will work north of Sault Ste. Marie. They will be housed in existing woods camps which are being inspected to ensure that living conditions are satisfactory. They will receive the prevailing wages and will be employed under the same general conditions as regular Canadian woodsmen. The largest single group consisted of men from the Baltic countries, with a considerable number of Poles and smaller numbers from other countries. Their ages ranged from 19 to 41, with most of them under 35. Practically all have had some experience in one type of woods employment or another.

Washington Asks Bids On Alaskan Pulpwood

WASHINGTON — Bids on 1.5 billion cubic feet of Alaskan pulp timber from national forests, have been invited by the Forestry Service of the Department of Agriculture.

The Department began advertising last week. The sale will require the purchaser to build a pulp mill in the Tongass National Forest at a cost of from $20 to $30 million, it was stated.

The sale is the first of a number contemplated by the Government under a program to support development of several similar mills and contingent communities in Southeast Alaska, it was added by the Department. President Truman recently signed a bill designed to permit sale of the timber, and at the same time, safeguard any Indian rights, or rights of others having claim to any of the area involved. All proceeds of the sales are to be held in a special Treasury account until the rights of those concerned have been determined, possibly by future legislation, it was learned.

Preliminary statements must be filed with the Chief of Forest Service by September 8, 1947, covering financial responsibility, experience in making and distribution of pulp and paper products, or in construction and operation of large industrial projects, with other data.

The area of the sale is in the general vicinity of Petersburg and of Thomas Bay, in central Southeast Alaska. Of the billion and half feet proposed to be sold, about 75 percent is estimated to be western hemlock, and 25 percent Sitka spruce, with small quantities of Alaska and western red cedar; about 15 percent is estimated more valuable for lumber, piling, etc.

Lee Chamber Exhibit Includes Smith and Hurlbut

LEE, Mass.—The Smith Paper Company and the Hurlbut Paper Company have placed an exhibit of their products on display at the Lee Chamber of Commerce booth here.

Finished in blue with silver trimmings, the Smith exhibit follows the papermarking process, starting with raw flax and finishing up with samples of the final cigarette paper product.

Also included in the display are condenser papers, plain, with the conductor filter added, and several sample condensers typical of the uses to which this paper is put. Carbon papers, filter-tip paper, and Bible papers are also on display.

The Hurlbut exhibition shows samples of inter-deckles, filter papers, photographic paper and plastic compounds derived from a paper base.

On the table of samples is a coffee brewer filled with coffee, showing how Hurlbut's paper filters are used in the coffee brewing process.

LOOK AT THIS

if you're interested in continuous, maximum paper machine output and in maximum water removal at the presses where it costs least.

This picture gives visible evidence of the action of the Vickery Felt Conditioner on a press felt. The four conditioner boxes have just cleaned the light areas and are moving to work on the dark areas.

For recommendations and estimates, write Bird Machine Company, South Walpole, Massachusetts.

THE VICKERY FELT CONDITIONER

Cooper Again Elected Pacific Mills Head

VANCOUVER, B. C.—Shareholders of Pacific Mills Ltd. reelected Paul E. Cooper as president of the company and its operating subsidiaries at the firm's annual general meeting held in Vancouver, B. C., on Monday, August 4. Louis Bloch was returned as chairman of the board of directors. J. A. Young, formerly vice-president and treasurer, has been named first vice-president of the company. Other officers reelected were H. C. Pim and T. B. Jackson, vice-presidents, and J. H. Lawson, secretary.

There were no changes in the company's board of directors which, in addition to Messrs. Cooper, Bloch, Young, Lawson, and Pim, includes Col. the Hon. E. W. Hamber, CMG, Mayne D. Hamilton, W. D. McLaren, W. E. Wintemute and Frank N. Youngman.

Mr. Cooper, who has been Pacific Mills president since 1943, has been connected with the pulp and paper industry since shortly after his graduation as a civil engineer from McGill University in 1923. He worked on the construction of International Paper Company plants at Three Rivers, Gatineau and Dalhousie, and also carried out hydro-electric developments for the International company in the United States.

In 1930 he was appointed resident engineer for that company's mill at Piercefield, N. Y., and three years later became manager of the Continental Paper and Bag Company's mill and converting plant at Rumford, Maine.

Mr. Cooper moved to England in 1935 as chief engineer for Thames Board Mills Ltd., and assumed the managership of their Warrington plants in 1937. He was made general manager and director of the organization in 1939, and remained in England until he joined Pacific Mills Limited.

Under Mr. Cooper's leadership Pacific Mills Limited, with headquarters in Vancouver and its main pulp and paper plant at Ocean Falls, has made rapid progress. The company carried out an extensive wartime program, both in the production of pulp and paper and high grade spruce for aircraft manufacture. It acquired the 20-year-old Vancouver firm of Canadian Boxes Ltd. in 1945, and now operates it as a manufacturing and sales subsidiary for corrugated and solid fibre shipping containers.

In the same year Pacific Mills embarked on a $5,000,000 expansion program which included the purchase of large timber holdings on the Northern mainland, Vancouver Island and the Queen Charlotte Islands of British Columbia. It also established "family home" logging camps at Beaver Cove and Sandspit, and formed logging and marine transportation subsidiary companies.

PAUL E. COOPER

At Ocean Falls, 310 miles northwest of Vancouver, a number of mill improvements have stepped up the company's production of newsprint, kraft and specialty papers to approximately 140,000 tons annually from a pre-war total of some 103,000 tons. The plant is the only one in Western Canada manufacturing kraft paper, and is the most northerly paper mill on this continent.

Sales in the fiscal year 1946-1947 reached an all-time high of $16,046,-249.05.

Bulking large in the company's program have been townsite improvements at Ocean Falls. The sum of $2,000,000 has been expended in the building of apartment houses, duplex housing units, dormitory buildings, a medical clinic, theatre and an up-to-date 265 room residential hotel for the accommodation of single employees.

This hotel, named Martin Inn in honor of Pacific Mills' first general manager and president of the company from 1918 to 1944, the late Archie B. Martin, was officially opened on July 31. Containing all the amenities and services of a first class city hotel it will provide living quarters for 350 persons and will serve as a social center for Ocean Falls' 2,500 residents. Rated as British Columbia's fourth largest hotel, its cost was approximately $1,000,000.

The company recently purchased a 14-acre tract of land in Vancouver's newly-zoned East Broadway industrial district, and is considering the construction of a large and completely modern paper converting plant to supplant its present factory at the foot of Campbell Avenue on Burrard Inlet.

Rochester Receives Record Cargo

ROCHESTER, N. Y.—The largest shipment of newsprint ever received at the Municipal Terminal was moored at the Port of Rochester recently. The S.S. Birchton was unloading 867 tons of newsprint brought from Corner Brook, Newfoundland. The cargo is for The Democrat and Chronicle, The Times-Union, Syracuse Post-Standard and the Oswego Palladium-Times.

It is the second trip to Rochester for the Birchton and the third cargo of newsprint to arrive at the Port of Rochester this year, according to Joseph A. Biehl, harbor master.

Before the winter weather sets in, the Birchton is expected to make five more trips with newsprint cargo.

Rogers Readies Plant For Increased Output

AUSABLE FORKS, N. Y. — Production facilities at the J. & J. Rogers Company are to be increased on an extensive scale with the installation of new equipment which is now nearing completion. A new mechanical turbine and new steam line have already been installed and installation is also about completed on a new boiler. The latter will replace two obsolete installations and will greatly increase the steam capacity required in the production of paper. The project was started early in the spring and is expected to cost in the neighborhood of $200,000. Paper production has been at a standstill for several weeks because of the extensive renovations. A general readjustment of machinery has been effected in the machine department where new floors have also been laid. The majority of employes have been employed in the repair department since returning from the annual vacation period and overtime schedules have been observed in order to resume production schedules as soon as possible.

Consolidated Files Suits Under Massey Patents

WISCONSIN RAPIDS — The Consolidated Water Power & Paper Company, on July 28, filed suit against The Mead Corporation, Dayton, Ohio, charging infringement of United States Letters Patent Nos. 1,921,368 and 1,921,369. These patents known as the "Massey Patents" refer in part to the coating of paper in one continuous process on the paper machine. The suit was filed in the United States District Court for the Southern District of Ohio, Western division.

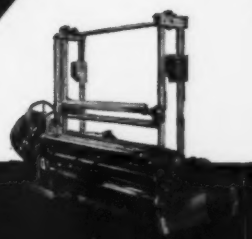
This is the second patent infringement suit filed, Consolidated having filed a suit against Kimberly-Clark Corporation, Neenah, earlier on the same patents. This suit was filed in the United States District Court for the Eastern District of Wisconsin.

Heath Acts for Egan Group

BOUND BROOK, N. J. — Frank W. Egan & Company and the Bound Brook Engineering Company have made arrangements with The Heath Company, 150 Broadway, New York, to represent them in all foreign countries in the sale of paper converting machinery. At the present time both companies are carrying on a considerable amount of business in the export field.

A CLEAN CUT • A SHEAR CUT

TYPE "AA" BUILT 40" TO 72" WIDE. SPEED, 1500 F.P.M. MINIMUM CUT 3/4".



IN LANGSTON'S IMPROVED METHOD OF SLITTING, THIS FRONT SHAFT, THROUGH A SIMPLE AND CONVENIENT CONTROL, IS MOVABLE NOT ONLY RADIALLY BUT LATERALLY. ALL SLITTER BLADES MAY BE DISENGAGED SIMULTANEOUSLY ALONG A HORIZONTAL PLANE—THEN SWUNG OUT AND AWAY FROM THE REAR SLITTERS. AMPLE ROOM IS INSTANTLY PROVIDED WITH THREE LOCK POSITIONS; ONE FOR *THREAD-UP*, ONE FOR *SET-UP* AND ONE FOR *OPERATING*. ASK FOR FURTHER DETAILS.

SAMUEL M. LANGSTON COMPANY, CAMDEN, NEW JERSEY

LANGSTON! SLITTERS AND ROLL WINDERS

Newsprint Shipments Hit New July Mark

NEW YORK — Newsprint production in Canada during July 1947 amounted to 379,731 tons and shipments to 379,065 tons, according to the News Print Service Bureau. Production in the United States was 67,656 tons and shipments were 68,955 tons. The output in Newfoundland was 32,586 tons and shipments were 33,948 tons making a total North American production of 479,973 tons and shipments of 481,968 tons, compared with continental production of 451,099 tons and shipments of 451,265 tons in July 1946. North American production in July 1947 was greater than in any previous July on record.

The Canadian mills produced 213,135 tons more in the first seven months of 1947 than in the first seven months of 1946, which was an increase of 9.0 percent. The output in the United States was 29,046 tons or 6.4 percent more than in the first seven months of 1946; in Newfoundland production was 3,497 tons or 1.7 percent more, making a total increase of 245,678 tons, or 8.1 percent more than in the first seven months of 1946, and also was higher than in any preceding similar period.

Stocks of newsprint paper at the end of July were 91,097 tons at Canadian mills, 10,652 tons at United States mills, and 62,074 tons at Newfoundland mills, making a combined total of 163,823 tons compared with 165,818 tons on June 30, 1947, and 199,290 tons at the end of July 1946.

Box Makers Sweep Robertson Contests

MONTVILLE, Conn. — The presentation of service pins by President Ralph Powers to 47 employees who have completed five years of service or multiples thereof featured the twelfth summer outing of the Robertson Paper Box Company held Saturday, August 9, at Ocean Beach Park. President Powers in his presentation address expressed the company's appreciation to the employees who have completed extended periods of service with the company.

Uncertainty of the weather made many of the employees and their families late in arriving. However, the majority were on hand for the start of the softball game between the box factory and the board mill which got under way at 10:30 a.m. The game was won by the box makers 14 to 7.

The volley-ball game between the board mill and the box factory was also won by the box makers in a close 21 to 20 finish.

Variety games and races were directed by George D. Garvey, summer playgrounds director.

The box factory again triumphed over the board mill in the tug of war, and the married women defeated the single girls in the same event.

A steak dinner was served in the auditorium at 1 p.m. Fred Feegel of the Connecticut State Police Department was song leader and soloist during the dinner program. The tremendous ovation accorded Mr. Feegel and the number of encores requested indicated his popularity. Employes and officials from New York and Boston were present.

Newspaper Stocks Up; Consumption Increases

NEW YORK—Daily newspapers reporting to the American Newspaper Publishers Association had 41 days supply of newsprint on hand and in transit at the end of July 1947. This represents an increase of 10 days supply over June 1947. These stocks of 41 days at the end of July 1947 compare with 37 days at the end of July 1946; 54 days at the end of July 1945 and 52 days at the end of July 1941.

Daily newspapers reporting to the ANPA consumed 263,698 tons of newsprint in July 1947 compared with 243,072 tons in July 1946 and 215,012 tons in July 1941. This was an increase in July 1947 over July 1946 of 8.5 per cent and an increase over July 1941 of 22.6 per cent.

The total estimated newsprint consumption in the United States for July 1947 was 361,230 tons which includes all kinds of uses of newsprint. For the first seven months in 1947 it is estimated to be 2,718,267 tons. During the first seven months of 1947 the reporting newspapers used 1,984,335 tons of newsprint, an increase of 14.4 per cent over the first seven months of 1946 and an increase of 17.9 per cent over the first seven months of 1941.

Instrument School To Start September 15

PHILADELPHIA — The Brown Instrument Company will start next month the twelfth consecutive year it has conducted continuing courses of training in industrial measuring and control devices at its school of instrumentation in Philadelphia. Enrollments closed August 1 for the first 1947-48 term which opens on September 15.

Classes for the fall semester will be made up of engineers and instrument staff members of customers of the industrial division of Minneapolis-Honeywell Regulator Company. The group will include representatives from China, India and other countries.

The course will include instruction in pyrometers, continuous balance electronic potentiometers, electrical and air-operated automatic controls, flow meters and thermometers. The first semester will end on December 12.

W.A.A. Offers Case Liners From Army Surplus

More than 650,000 war-surplus, waterproof paper case liners, also described as waterproof barriers or box liners, are being offered by War Assets Administration in a sealed bid sale closing September 10, 1947.

The liners, originally designed as protective inner packing for cases shipped overseas, are expected to be of interest to bag dealers, paper converters, florists and nurserymen and waste paper dealers. They can be used as is for many water-proofing purposes, such as wrapping shrubbery, roots or rose bushes.

The liners are unused and come in a wide variety of shapes and sizes. Most are constructed of L-2 waterproof paper made of two sheets of heavy uncreped kraft paper cemented together with asphaltum and having one sheet coated, saturated or infused with asphalt; the remaining liners are made of Type C waterproof paper consisting of two sheets of uncreped, asphalt laminated kraft paper.

The approximate total inventory of 651,500 pieces is distributed among eight WAA regions as follows: Boston —8,100; Cleveland—104,000; Detroit —39,000! Louisville—24,600; Minneapolis—14,200; New York—408,500; Philadelphia—40,000; and Salt Lake City—13,100.

The minimum lot purchasable is the total offered at any one of the above WAA inventory locations, or 50,000 pieces, whichever is the lower. The maximum purchase is the total inventory of approximately 651,500 pieces.

The liners are packed generally in bundles or bales and are offered as is, f.o.b. location. All bids must be submitted by 5 P.M., September 10, 1947, at the Customer Service Center, War Assets Administration, Temporary Building "R," 4th Street and Jefferson Drive, S.W., Washington 25, D. C.

Gypsum Advances Four In Industrial Division

BUFFALO, N. Y.—Four major personnel appointments marked a general readjustment in the industrial division of the National Gypsum Company which was made necessary by a "rapid expansion" of that department, President Melvin H. Baker announced.

The following appointments were made: William U. Townsend, assistant manager of the Industrial Division; Raymond W. Haugh, manager of industrial lime sales; Walter S. Hamme, agriculture sales manager, and Douglass H. Shearer, eastern district industrial sales manager.

"Each of these men has been with the company for at least seven years, and their appointments represent National's policy of advancing employes within the organization whenever it is practical," Baker declared.

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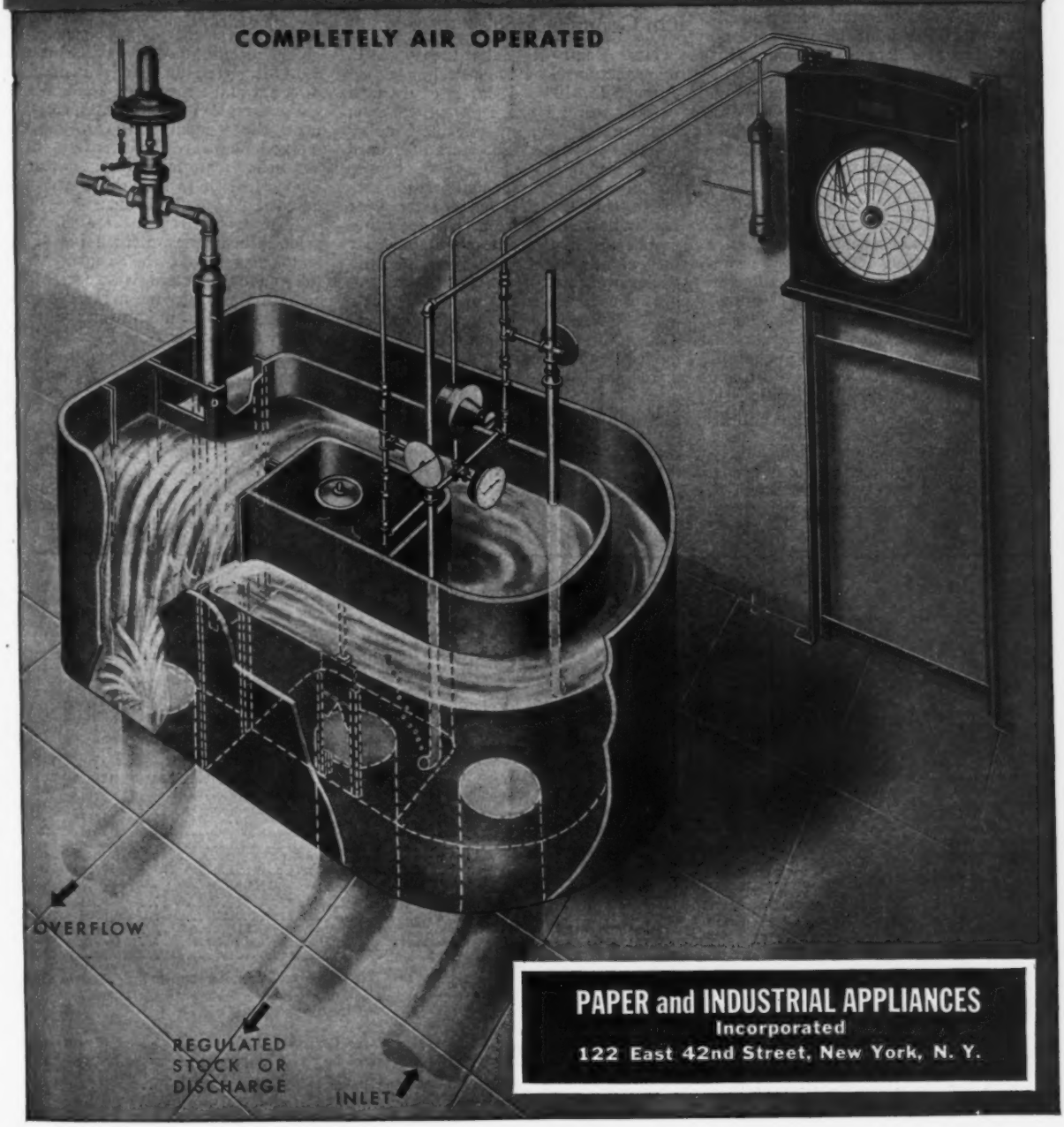

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FINANCE

Eagle A Anticipates Mortgage Retirement

HOLYOKE, Mass.—For the first time in its nearly fifty years of existence, the American Writing Paper Corporation will probably be free and clear of mortgage bonds before the end of 1947. "It is anticipated that affirmative action will be taken before the close of the year to redeem the remaining $505,550 General Mortgage Bonds outstanding," was the statement made by Thomas H. Blodgett, chairman of the board and president of the company.

Blodgett made this report to the stockholders in connection with the semi-annual business report of the company which showed a $373,627 profit in the first six months of the year. For the same period in 1946, Eagle A earned $122,059.

The scheduled clearing off of the bonded indebtedness will conclude a notable financial accomplishment. When American Writing Paper was reorganized ten years ago and the Blodgett interests took over, a bond issue of close to $3 million was floated. During the past decade, steady progress has been made whittling off this obligation. All but $505,550 has been paid off, and with continued profitable operations in the last of the year, these will be called in.

"Compensating sales price adjustments to meet these and other cost increases influences are required to regain an equitable margin between costs of manufacture and sales prices in the ensuing months," Blodgett said.

"Vital raw materials continue to be in critically short supply. Domestic wood pulp is inadequate to meet all needs and foreign pulp has been available only at prices in excess of comparable domestic grades," he added.

The report also showed that for the second quarter of the year, the net profit transferred to surplus was $193,701.79, compared with $97,584.67 for the corresponding period of 1946.

Rayonier Resumes Payments On Common Stock

NEW YORK—Rayonier Incorporated, manufacturers of wood cellulose, on August 11, 1947, declared a dividend of 50 cents per share on the common stock of the company, payable October 15, 1947, to the stockholders of record September 30, 1947.

The company's excellent earning record during the first half of the year and indications that current operating results are likely to be maintained for the balance of the year, warranted the declaration at this time, of a dividend on the common stock for the last half of 1947, President Bartsch announced. This is the first dividend that has been paid on the common stock since 1943 and is in keeping with the statement made at the annual meeting of stockholders in April, that a dividend on the common stock would be paid later this year. Mr. Bartsch also announced that it is expected that early in 1948 the common stock of the company will be placed upon a regular quarterly dividend basis.

IPCO Profit Doubles In First Half-Year

NEW YORK—Consolidated net profit of International Paper Co. in the six months ended June 30 spurted to $26,407,910, equal to $7.29 a common share, more than double the $11,477,417 or $3.09 a share reported in the initial half of 1946. Sales and other income soared to $200,901,484 against $132,677,558 in the first six months of 1946.

Richard J. Cullen, chairman, pointed out that net profit from operation amounted to $32,319,043 in the initial half of this year, compared with $11,896,235 the year before.

However, this was reduced by $5,911,133, cost of prior service benefits under retirement plans. In 1946, first half operating profit was reduced by $418,818 premium and unamortized discount and expense on bonds retired.

Pointing out that rising prices had upset the company's inventory pricing method and forced unit prices of inventories materially above those on Dec. 31, 1936, when the system was adopted, Mr. Cullen said:

"The appropriation for inventory price adjustment provided in the second quarter and to be provided in subsequent quarters will correct this condition and provide a reserve to reduce inventory unit prices approximately to those existing Dec. 31, 1936."

Earnings for the second quarter amounted to $14,747,370 or $4 a share against $7,235,905 or $1 a share in the corresponding 1946 period.

In the quarter, demand continued strong, according to Mr. Cullen. He said that exceptionally favorable operating conditions and economies in operations approximately offset decreased net sales, prices and wage increases.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending August 15, 1947

STOCKS

	High	Low	Last
A. P. W.	....	....	....
Armstrong Cork Co.	46¼	45¾	46
Armstrong Cork Co., pf.	108½	108	108½
Celotex Corp.	28⅜	27	28⅜
Celotex Corp., pf.	20½	20¼	20¼
Certain-Teed Products Corp.	17¾	16⅞	17⅝
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	24¼	23¼	24
Champion Paper & Fibre Co., pf.	108	106½	108
Congoleum Nairn Co.	31⅝	29½	31⅝
Container Corp. of America	43	40¾	43
Container Corp. of America, pf.	103⅞	103⅝	103⅝
Crown Zellerbach Co.	31½	29⅞	31¼
Crown Zellerbach Co., pf. 4.20	106¾	105⅜	105½
Crown Zellerbach Co., 4 pf. 4	117	114	117
Dixie Cup Co.	37½	36	37½
Dixie Cup Co., A	....	....	....
Flintkote Co.	35	32	35
Flintkote Co., pf.	107½	107½	107½
Robert Gair	9⅛	8⅛	9⅛
Robert Gair, pf.	20	20	20
International Paper Co.	49	45¼	49
International Paper Co., pf.	106	105⅜	106
Johns-Manville Corp.	43½	42	42¾
Johns-Manville Corp., pf.	....	....	....
Kimberly-Clark Corp.	24⅞	24⅛	24½
Kimberly-Clark Corp., pf.	111½	109½	111¼
Mac Andrews & Forbes	38¾	38¾	38¾
Mac Andrews & Forbes, pf.	148½	148½	148½
Marathon Corp.	24¼	23¼	24
Mead Corp.	21½	20¾	21½
Mead Corp., pf. 4¼	97½	95	96
Mead Corp., pf. 2	....	....	....
National Container Corp.	15⅛	14⅜	15⅛
Paraffine Companies, Inc.	69	67¾	67¾
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	27¼	25½	27¼
Rayonier, Inc., pf.	36½	36½	36½
Ruberoid Co.	57	55	57
St. Regis Paper Co.	10¾	10¼	10⅝
St. Regis Paper Co., pf.	96¾	95	96
Scott Paper Co.	47¾	45½	47¾
Scott Paper Co., pf.	103¼	103	103
Sutherland Paper Co.	41	39	41
Union Bag & Paper Corp.	34½	32¾	34½
United Paperboard Co.	14⅝	14¼	14⅜
U. S. Gypsum Co.	101	98¼	100¼
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	40⅞	40½	40⅞
West Virginia Pulp & Paper Co., pf.	109½	109½	109½

BONDS

Abitibi Pulp & Paper Co., 5s '53	....	....	....
Celotex Corp., 3¼s '60	....	....	....
Certain-Teed Products Corp., 5½s '53	....	....	....
Champion Paper & Fibre Co., 3s '65	....	....	....
Mead Corp., 3s '66	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending August 15, 1947

STOCKS

	High	Low	Last
Great Northern Paper Co.	45½	45½	45½
Taggart Corp.	....	....	....

BONDS

American Writing Paper Co., 6s '61	....	....	....

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U. S. Envelope Sales Up by 27 Per Cent

SPRINGFIELD, Mass.—Increase in net profit of a half million dollars, and 27 percent in sales for the six months ended June 30 over a similar period a year ago, has been reported by the United States Envelope Company board of directors.

For the same period, $635,735.54 was spent for machinery and equipment, and $337,374.01 for land and buildings.

The board declared a semi-annual dividend of $3.50 per share on preferred stock and $2 per share on the common stock, plus a special dividend of $3 per share on the common, for a total on the common of $5 per share.

The statement, which was issued by the company following the directors meeting, and which has been sent to all stockholders, follows:

"The books of the company are not closed until the end of the year, and the operating results for the first six months' period of the year 1947, as indicated below, are subject to final audit.

"The estimated net earnings for the six months ended June 30, 1947, were $833,200.79 after depreciation charges and after estimated federal income taxes. The comparable figure of estimated net earnings for the period Jan. 1 to June 30, 1946, was $330,302.22.

"The board of directors, at a meeting on Aug. 14, 1947, declared the semiannual dividend of $3.50 per share on the preferred stock and a dividend of $2 per share and special dividend of $3 per share, total $5 per share on the common stock, payable on Sept. 2, 1947, to stockholders of record Aug. 20, 1947.

"Sales for the six months' period ended June 30, 1947, were 27 percent above similar period of 1946.

"Stock inventories were approximately $56,000 higher on June 30, 1947, as compared with Dec. 31, 1946.

"During the six months' period ended June 30, 1947, surplus account was increased by estimated net earnings of $833,200.79 and adjustment resulting from the sale of Hartford (Conn.) property in amount of $285,260. Surplus account was reduced by preferred dividend of $138,957, and common dividend of $131,250, paid on March 3, transfer of $200,000 to reserve for inventory and postwar adjustments account, Monarch Envelope Co. Division liquidating expense of $15,133.78 and renegotiation of Federal war contracts for the year 1945 in amount of $9,146.89. Net increase in surplus account for the period was $623,973.34.

"In the six months' period ended June 30, 1947, there was spent $635,735.54 for machinery and equipment. For land, buildings and building construction, there was spent $337,374.01.

"Additional funds to finance the company's program of new plant construction and modernization of machinery and equipment have been made available through a term loan agreement entered into with the First National Bank of Boston on April 1, 1947. The agreement provides for a 10-year loan in amount of $2,500,000 at interest rate of 2½ percent per annum. Under the terms of the agreement, $1,650,000 was advanced to the company on April 1, 1947, and the balance, $850,000, will be taken out within one year from the date of the agreement.

"Property located at 252 Pearl Street, Hartford, Conn., was sold in April, 1947. Stationery stores operated by the company at that point and at West Hartford and Bristol, Conn., were also sold in April, 1947. The envelope plant, formerly known as the Plimpton Manufacturing Co. Division and now known as the Hartford Division, operates in another building which was not sold.

"The Monarch Envelope Co. Division at Lititz, Penna., was discontinued in February, 1947.

"The new plant at Doraville, Ga., known as the Atlanta Division, commenced operations in April, 1947.

"Orders received during the past few months have shown a decline. Raw materials are being received in sufficient quantities to allow us to continue in full production. Costs on all raw materials are increasing. A wage increase of 10 percent per hour was made to all employees effective Aug. 4, 1947. Considering all of these factors, it may be expected that operations for the balance of this year may not reflect earnings commensurate with the first six months' period."

Marathon Lets Contracts For Townsite Expansion

TORONTO, Ont. — Marathon Paper Mills of Canada have let contracts for expansion of their newly-built mill at Marathon townsite, 55 miles southeast of Schreiber, Ont., as well as for road improvements, a water intake pipeline, two churches, and 17 dwellings. The Foundation Company of Ontario will start immediately on the $750,000 development. D. G. Ross is the engineer, while W. L. Somerville is the architect for 16 of the houses and Rodolphe Lajoie for the new home for resident manager R. T. Steedman.

Kimberly-Clark Sets Up Permanent Honor Roll

NEENAH, Wis.—A bronze plaque bearing the names of ten permanent employes of the Badger-Globe mill of Kimberly-Clark Corporation who lost their lives while in the armed services during World War II was unveiled Thursday, August 14, at a noon ceremony. The tablet, on the wall of the mill, near the outside entrance, replaces a temporary honor roll.

The temporary honor roll carried the names of 250 permanent and 94 temporary employes of Badger-Globe who were in uniform during the war. It included the names of five women.

Great Lakes Raises Funds for Expansion

TORONTO—A new issue of $1,750,000 first mortgage sinking fund 3½ percent bonds of Great Lakes Paper Company were offered last week by Wood, Gundy & Company and Gardiner & Company. The bonds, dated Aug. 1, 1947, mature Aug. 1, 1967, and were offered at $100 and accrued interest to yield 3.5 percent and were quickly oversubscribed. Proceeds, together with other funds, are for the program initiated in late 1946 for increasing the capacity and efficiency of the company's Fort William mill. Total estimated cost of the program is about $2,625,000. It is anticipated that work will be completed in 1948.

It is expected the expenditures will enable the company to increase its annual newsprint capacity by 20,000 to 25,000 tons and to affect important savings through lower production costs. The additional newsprint will be taken up by the company's present customers to meet their increased requirements for paper, it is anticipated.

Capitalization giving effect to the financing will consist of $4,570,000 3½ percent bonds due 1967; 100,000 no-par-value class A preferred shares; 100,000 no-par-value class B preference shares and 400,000 no-par-value company shares. Maximum annual interest charges on the first mortgage sinking fund bonds will amount to $221,200, of which $159,950 is payable in Canadian and U. S. dollars at the holder's option, it is stated. (This compares with 1946 bond interest of $256,543.) Other bonds disclosed by the prospectus are: (1) The company carries fire insurance of $7 millions on insurable buildings and equipment and its mill, which are carried at a depreciated book value of $4,696,286. In other words assets would appear to be well depreciated. (2) Purchasers of the 3½ percent bonds due 1966, sold privately in 1946, were the Mutual Life Insurance Company of New York and the Northwestern Mutual Life Insurance Company. (3) The company's investment in its wholly owned subsidiary, Superior Timber Company, carried in its own books at cost of $50,000, would apparently only have a book value of $11,989, as total assets of the consolidated balance sheet show a reduction of $38,011 from the balance sheet for the company.

Smith's Colts Beat Old Timers

KAUKAUNA, Wis. — A five-inning softball game was played before a recent meeting of the Quarter Century Club of Thilmany Pulp and Paper Company. Smith's Colts, captained by L. C. Smith, defeated Leddy's Old Timers, 5 to 2. Jack Leddy was captain of the latter team. The club adopted memorials to the late Joseph Reichel, Carl H. F. Busse and Mathias A. Keller, all of whom were members.

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Rennebohm Hails Petenwell Project

WISCONSIN RAPIDS, Wis. — Acting Governor Oscar Rennebohm on August 14 congratulated George W. Mead, president of the new Wisconsin River Power Company, after the announcement of the new Petenwell project.

"I congratulate you on the foresight, planning, initiative and industry which over a period of 26 years have culminated in this announcement of such great importance to our state," he said. "I congratulate the people of Wisconsin, and particularly residents of the Wisconsin river valley, on the good fortune which is and will be ours with the construction and completion of this most constructive undertaking.

"The scope of this accomplishment almost defies description. Resulting will be millions of kilowatt hours of additional power produced, new transmission lines strung to various points about the state, thousands of new construction jobs created in a new man-made lake, new cottage sites, improved fishing and hunting grounds and recreation facilities, Wisconsin industry stimulated by the availability of more power, and new taxable wealth for our state.

"Wisconsin will be very grateful to you as the motivating factor behind this development down through the years, and to all those workers and planners throughout the valley who made their substantial contributions as residents of Rhinelander, Tomahawk, Merrill, Wausau, Stevens Point, Wisconsin Rapids, Portage and adjacent communities."

Governor Rennebohm came to Wisconsin Rapids to be one of the speakers on the Wisconsin Network broadcast the same evening, when the new project was dedicated. Among other speakers were Messrs. Mead, Kohlhepp, Neff, and Harza.

In a statement, Kohlhepp expressed pride in his company's association with Consolidated in the project.

"The Wisconsin river and its tributaries produce, I believe, more power and wealth, in proportion to size, than any other river in the nation. George W. Mead and his associates probably have done more than all other interests to make it so useful to the citizens of the entire state. The 22 reservoirs and 23 power dams not only produce enormous amounts of power, but also reduce floods, increase low flows, reduce pollution, improve sanitation, and promote fish and other wild life conservation.

"I am also proud of the fact that Wisconsin and its enterprising citizens and investors, traditionally independent, self-sustaining people, have done all this on their own, without assistance from the federal government and federal taxpayers. On the contrary, the Wisconsin river, unlike a number of other rivers I could name, not only does a magnificent job, but also stands on its own feet, pays its own way, and helps all other taxpayers — local, state and federal—by paying its fair share of all taxes."

Mr. Neff also acclaimed the project as a great development and expressed satisfaction that his company would have a part in it.

Mr. Mead, who for many years has envisioned the Wisconsin as a source of tremendous power, said in his statement announcing the Petenwell project that the Wisconsin probably will be one of the most full developed and hardest working rivers in the United States, with the water being used over and over to the benefit of all valley interests.

"The Wisconsin river has its source 1650 feet above sea level in La Vieux des Sert on the Wisconsin-Michigan boundary," he said. "It flows 430 miles through the center of the state before emptying into the Mississippi near Prairie du Chien, having a total fall of 1050 feet and draining an area of 11,705 square miles, which is over one-fifth of the territory of the state.

"Credit for their origin and growth must be given to the Wisconsin river by such thriving towns as Rhinelander, Tomahawk, Merrill, Wausau, Stevens Point, Wisconsin Rapids, Portage, and their attendant communities.

"In the earliest days, navigation was the most important use of the river, giving way to the floating of logs and later to the production of power as its principal function. The first power dams were erected for grain milling. This was succeeded by pulp and paper manufacture as the major use of the river, together with hydro-electric power for all purposes in homes and industry."

He also stressed the value of storage and power dams in the control of floods, in checking pollution, and in benefiting conservation.

"While the general public shares in the benefit from the reservoirs, it pays no part of the cost. On the contrary, taxes took over 30 percent of the reservoir tolls charged during 1946. . . . I think it very significant that all this has been done by private capital, paper companies and power systems," Mr. Mead said. "No taxpayer anywhere, state or federal, has had to contribute a penny. The people of Wisconsin are receiving the various benefits at no cost while, in reality, some of the federal tax money along with that of all other individual and corporate taxpayers in Wisconsin is being used in some areas to do similar things."

Britain Plans Reforestation

VANCOUVER, B. C. — Forests in Britain which were depleted during the war are being re-established under a 50-year government program, according to L. R. Andrews, secretary-manager of the B. C. Lumber Manufacturers' Association, who has returned to Vancouver after attending a British Empire Conference dealing with lumber problems.

Consolidated Joins Power Dam Project

(Continued from page 7)

will be the Harza Engineering Company, Chicago, which specializes in hydro-electric engineering and which has engineered some 40 huge projects, including Big Falls on the Flambeau river. Leroy F. Harza, its head, is consulting engineer for the proposed 2,000,000-kilowatt powerhouse on the International rapids section of the St. Lawrence river, now awaiting Congressional action.

The dam, which will be largely of concrete and earthwork, will be about 17,800 feet long with a head of 42 feet, second in height on the river to Grandfather Falls north of Merrill, where there is a drop of 95 feet. The later, however, has a generating capacity of only 75,000,000 kilowatt hours per year, as compared with an installed capacity at Petenwell of 20,000 kilowatts and an average output of about 115,000,000 kilowatt hours.

About 12,000,000 kilowatt hours will be added annually to this output with development of the George Mead reservoir on the Little Eau Pleine river, which has been authorized by the Wisconsin Valley Improvement Company and which will be the largest artificial reservoir in the state, having a capacity greater than the present 21 reservoirs owned by Wisconsin Valley Improvement, and which have a combined capacity of 17 billion cubic feet of water.

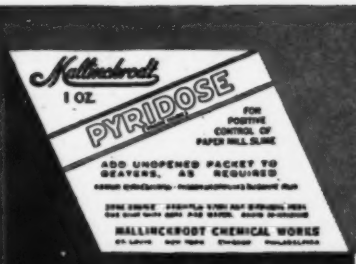
Wisconsin Rapids, Stevens Point and Portage will be served through transmission lines from the Petenwell power station. This station will be of concrete, steel and brick, and will house four generators, each of 5,000 kilowatt capacity and driven by 7,200 horsepower Kaplan type vertical, full adjustable blade water turbines.

The building will be 154 feet long and 200 feet wide at the base. It will extend 35 feet below present water level and 61 feet above the present water level. Since it will be founded on sand, steel sheet piling will be used to confine the sand immediately below the structure.

There will be 16 flood gates in the spillway section of the dam, each 30 feet wide and 18 feet deep, with a combine capacity for passing of 160,000 cubic feet of water per second. The highest flood of record at this site is about 80,000 cubic feet.

An earth dam 45 feet high will connect the powerhouse and gate section to the high land 8,500 feet to the east. It will be 240 feet wide at the bottom and 15 feet wide at the top. Two and one-half million cubic yards of material will be required for this.

Every effort will be made to encourage use of recreational facilities which will be created through the project. The entire flowage area will be cleared of all growth immediately, in order to assure favorable conditions for fishing, boating and swimming.



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Seek to Solve Strike At Diamond Match

SPRINGFIELD, Mass.—Conferences at Boston, aimed at bringing about an agreement between Diamond Match Company, and its employes, on the heels of an impromptu one-day walkout by seven engineers, have broken up without bringing about an agreement.

Progress was made at the August 14 session, according to a member of the State Board of Conciliation and Arbitration, but an impasse was reached on certain disputed points, such as double time for holiday work, sought by the employes, for which the company offered time and one-half; an overall pay raise of eight cents an hour if the company would agree to the entire general contract in effect for its unions elsewhere, and willingness of the company to accept the union's retroactive date of April 14 for pay boosts, instead of its original date of July 1.

Union spokesmen had stated that unless an agreement were reached, they would call a strike, and announced following the breakup of the conference that the matchmakers and operating engineers unions will meet on the 24th to take action.

Representing the company at the conferences were H. J. McDonald, plant representative; Joseph E. Duffy, general executive from New York, and C. H. Sickmon, plant manager.

Representing the workers were Charles J. Dearden, business representative of the Operating Engineers Local; Harry G. Calentine, steward of the same union; William E. Goldrick, president of the Springfield Central Labor Union and business agent of the company federal union, and James Moran, president of the Matchworkers Union.

The operating engineers called the brief strike after a meeting with management had failed to reach an agreement regarding wages and working conditions, then returned to work the following day ending the Boston conferences.

Denying newspaper reports that hundreds had crossed the picket lines set up by the seven engineers, Moran said that "not more than 23 of the 400 members of the Matchworkers Union" did so, adding that "operations were suspended at the plant because of the refusal of the men to go in."

Albany Felt Increases Its Wage Scale

ALBANY, N. Y.—The Albany Felt Co. has granted a general wage increase of 11 cents an hour to about 1,150 employes, the revision also being made at the Hoosick Falls subsidiary. The new contract is retroactive to July 14 and provides additional increases for some jobs in order to bring them into better balance with general company rates.

The new agreement is effective for a year and means that some workers will receive increases as high as 19 cents an hour. Labor representatives estimated that the cost of the increases to the firm would amount to about a quarter million of dollars.

The firm was represented in the negotiations by John C. Standish, vice-president; Harold Hedberg, assistant general superintendent; and Everett Reed, assistant superintendent. Labor leaders at the conference included James P. Corbett, John Hoda and Abram Pincus.

Rogers Increases Pay and Other Benefits

AU SABLE FORKS, N. Y.—The J. & J. Rogers Company has granted, effective August 8th, a 7 cents across-the-board increase in wages. In addition they are giving an extra paid holiday, bringing the paid holidays to four, and are installing a plan covering life insurance, occupational accident and sickness benefits, hospitalization, etc. This plan covers all operational, maintenance, supervisory and office employes, with more than 30 days service.

Life insurance coverage has been increased from $500 as in the past, to $1,000 for ordinary death. An additional $1,000 covering off-job accidental death has been added.

The sickness and accident benefit pays $25 per week, starting with the first day of accident, or after one week's illness. The hospital plan with surgical benefits covers not only the employes, but wives and children who have not reached the age of 19. This pays $5 a day hospitalization for employes, or $4 a day for dependents, for a maximum of 31 days for each hospitalization plus half that rate for continuation to 120 days additional. It also covers special hospital services to a maximum of $50 and surgical benefits to a maximum of $150.

Two years ago the J. & J. Rogers Company adopted a pension plan and there are now over forty men receiving pensions.

Luke Local Seeks Broader Contract

CUMBERLAND, Md.—President Wayne Ritchie declared that members of Luke Local 676, United Paper Workers of America (CIO), unanimously rejected a contract offer of the West Virginia Pulp & Paper Company for workers of the Luke, Md.; Williamsburg, Pa., and Covington, Va., plants.

"Members of the 1,900-member local instructed the negotiating committee to try again for a new contract," Ritchie said. "The action was taken at meetings held in Piedmont, W. Va.

"We want a wage increase," he declared, "but we also want to retain and add to the gains of the last three years and want a share of the company profits."

New Huyck Contract Increases Vacations

ALBANY, N. Y.—Results of negotiations under which employes of F. C. Huyck & Sons of Rensselaer receive additional vacation benefits were disclosed last week by Francis H. Eldridge, company president. Under the new plan, effective immediately, executive and administrative employes in the factory and office will receive three weeks' vacation with pay if they have been employed by the company since Dec. 1, 1946.

All employes with a total of 20 years of service, not necessarily continuous, on or before Dec. 31, 1947, will also receive three weeks' vacation with pay. Employes with 35 years of service will receive four weeks' pay.

Under the broader plan, Mr. Eldridge said, 300 employes will have three-week vacations and 41 will have four weeks with pay.

The remainder of the 1,400 employed at the Rensselaer plant will have a one week vacation after a year's service and two weeks after five years.

Employes represented by Local 76, United Textile Workers of America (AFL), became entitled to their additional vacation benefits through negotiations between the company and the union.

At the same time a new contract, effective for one year and including the vacation clause, was signed to supplant the contract scheduled to expire Oct. 1.

The union was represented in negotiations by Abraham Pincus, international representative, and its officers: Albert C. Ewasco, president; Daniel M. Foley, vice-president; Gregory B. Reilly, secretary-treasurer; James Greenshields, recording secretary; and Arthur H. Felt, Sr., sergeant-at-arms. Earl D. Rhodes, general superintendent, and W. S. Wooster, superintendent of manufacturing, acted for the company.

Northeastern Container Plant Affected by Strike

BRADFORD, Pa.—Breakdown of wage negotiations between the Northeastern Container Corporation and members of the International Brotherhood of Pulp, Sulphite & Paper Mill Workers, AFL, resulted last week in a strike call. It affected only 40 percent of the production workers, according to a company spokesman.

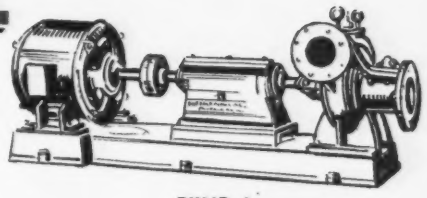
The union decided to walk out during a meeting attended by James Addesse, mediation service representative of Erie, after the company's counter proposal was rejected.

Ed Briney, works manager at the plant, said there was agreement on vacation, hours and holiday stipulations, but the pay negotiations had been inconclusive.

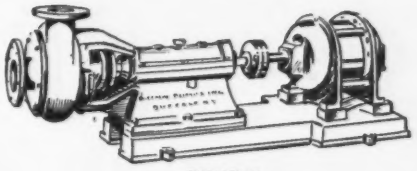
BEFORE YOU CHOOSE A PAPER STOCK PUMP

INVESTIGATE

THESE "Buffalo" FEATURES!



PUMP A



PUMP B

RUGGED, LONG-LASTING CONSTRUCTION

"Buffalo" Solid Shell Paper Stock Pumps have all oversize parts . . . ball bearings, stuffing boxes, subbase, overhung impeller . . . built to KEEP DELIVERING FOR YOU.

PERMANENT ALIGNMENT

Bearing housings are cast integrally with supporting head, and both are bored in the same operation.

HIGH EFFICIENCY SPLIT SHELL

"Buffalo" Split Shell Pumps offer advantages which many engineers prefer: easy inspection of rotor, without disturbing piping; replacement of rotor shaft or bearings, also without disturbing piping; simple design; durable bearing construction.

Data on all types in one Bulletin.

For all engineering data on "Buffalo" Paper Stock Pumps, write for Bulletin 953-F.

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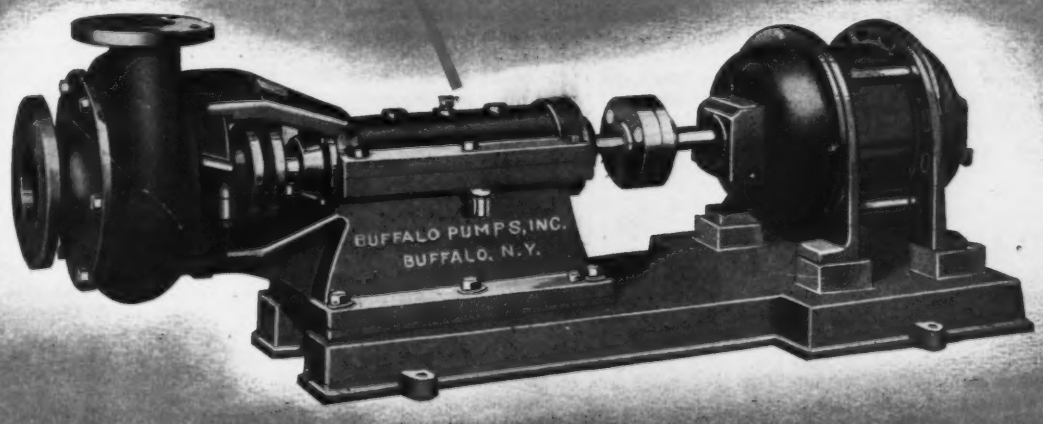

"Buffalo"

• SOLID SHELL
• SPLIT SHELL

PUMPS

General Kennedy Outlines New Dominion Forest Policy

TORONTO — When Major-General Howard Kennedy made public his report and recommendations on forestry August 11, it was generally agreed that he had at least given the government and the industry something to mull over. The essence of the report is that the province or wood cutting areas should be divided into a number of sections, each section to be in charge of a forest operating company made up of representatives of all interested parties, each company or operator holding a proportionate number of shares based on present limits and all drawing from the forest operating company according to their need the type of supplies required.

All licenses, agreements, permits and permissions would be suspended for a period of not less than ten years. In return, the government would assure to the present limit holders a supply of wood in perpetuity up to the present capacity of all domestic mills by a pooling of the resources of all provincial Crown lands and by establishment of a policy which will allow further expansion only when it has been established beyond question that wood is available without possibility of interference with domestic enterprise. Further extensions, commensurate with the productive capacity of the tributary forests, would be provided for, if justified, as soon as the true capacity could be ascertained. Exporters would receive quantities of wood commensurate with the productive capacity of their present limits, but not necessarily from the areas their agreements now cover. It is recommended that no export be permitted from an area which will prejudice the continued economic life or legitimate expansion of any domestic enterprise. There is, however, according to the report, enough material for all, including sawmills and exporters, if it is properly harvested and distributed.

"I contend that an assurance of standing timber in perpetuity is of more value to a limit holder, for purposes of financing, than his present insecure tenure under legislation which is now in the statutes of the province," the author of the report declares.

"All crown forest resources having been pooled, their sensible redistribution becomes simple and the major defects of the present system can be eliminated. I suggest that the province be broken down into 12 areas. The areas may be varied very considerably, not only with regard to boundaries but also in numbers, without seriously affecting the soundness of the scheme.

"Of the areas indicated, each contains several watersheds and in general supplies a central group of forest industries. Watersheds from which the wood will be delivered by rail are integrated with adjoining watersheds. Individuals or corporations, who hold limits or operate mills using the various forest products, would unite to form one Forest Operation Company in each of the areas. This would combine and coordinate all woods operations carried on within the area for any purpose whatever.

"I believe that the right of the individuals and corporations concerned to purchase wood from the operating company should depend upon the holding of shares in that company and that the quantity of such wood should be in proportion to the number of shares held.

"It is unnecessary to work out here all the details of the organization of these operating companies, but shares, with the ancillary right to purchase wood, could be all located on a combination of two factors:

(a) Average mill consumption or export shipment in units of wood by each individual or corporation over a five-year period or, in the case of mills which have not operated for a total of five years, average annual consumption.

(b) Area of limits now held by the individual or corporation within the watersheds included.

"Allocation of shares and wood entitlements to each unit of industry concerned is entirely feasible and equitable on the above basis. Such allocation will smooth out differences and eliminate unsound forest practices such as overcutting by mills too large for the limits which supply them, or undercutting on limits left partially dormant because they are too large for the mills they supply.

"Shares should carry a fixed dividend which would be a charge against the wood cost. Payment for shares could be made in cash or by shareholders turning over to the operating company their equipment, camps, improvements, surveys, working plans, etc., all of which would necessarily be evaluated on a standard basis by a referee or board of referees.

"No new industries or expansions of existing industries beyond those already under way should be permitted until it is ascertained that there is sufficient wood available to justify such expansion. When it becomes apparent that there is a surplus of wood over current needs in any forest operating company's area, the surplus could be allocated by the Department of Lands and Forests to the industry which will provide the utmost in continued employment in the vicinity or, if necessary, could be diverted to some other operating company in whose area a shortage of wood was found to exist. The allocation of surplus wood should naturally be carried out after consultation with the industries concerned and I can see where the Advisory Board to the Minister could be of great value in advising on these allocations or dealing with complaints, which will be inevitable, where large quantities of forest products are concerned.

"If the right to purchase wood from the operating company is to be dependent upon the holding of shares, provision will have to be made for the compulsory sale of shares, at a fixed price, by individuals or corporations which cease to utilize, for a period of say two years, the quota of wood to which they are entitled."

The forest operating companies would be managed and administered by boards of directors, and it is strongly recommended by the report that the Province should have a representative on the board of each such company. "It is realized that having a member on such a board might lull the public into a false sense of security, but I believe that the overall advantages of such representation more than overbalance the disadvantages. In any event, the scheme is entirely feasible without government representation on the board.

"I would further suggest that the other members of the directorate should be appointed from the various groups represented on the following basis:

(a) Where pulpwood-using industries have consumed the bulk of the wood produced in the preceding five years: Pulp and paper mill group, 2 directors; sawmill group, 1 director; pole and tie operators' group, 1 director; exporters' group, 1 director; small operators' group, 1 director.

(b) Where sawmill operators have consumed the greater part: Sawmill group, 2 directors; pulp and paper mill group, 1 director; pole and tie operators' group, 1 director; exporters' group, 1 director; small operators' group, 1 director.

"With such representation for the various interests, no particular group would be able to dominate the situation. Directors, as soon as elected, could proceed to select operating officials from amongst the best of the personnel of all the groups represented, and actual forest operations could then be undertaken.

"In the initial stages of the forest operating companies, cutting would probably proceed in the same areas from the same camps and with much the same personnel, and changes would gradually be undertaken over a period of several years. It is emphasized that forest operating companies could, and probably would, use contractors, company camps with small operators, or even allot to families small watersheds to cut over where circumstances so indicated, and that the system used would be governed by a combination

(Continued on page 38)

It runs in the family . . .

Ever since the days of ancient Egypt, paper making has been largely a family art, passed along from fathers to sons, from generation to generation. Even today in many of America's most important paper and board mills the top executives are men of advanced age, who learned their trade from their fathers and who now take pride in the fact that their sons will succeed them.

Not a few of those "old-timers" found Hamilton Felts on the machines at which they began their careers. Those felts had been made by the grandfathers of the skilled craftsmen who are now "key men" in the Hamilton organization. Their sons are in line for their places. **The knowledge, experience** and skill of generations are your assurance that there will always be a Hamilton Felt that will do your work better, faster and at lower cost.

« « » »

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

Pacific Mills Opens Its Community Hotel

OCEAN FALLS, B. C. — Martin Inn, the new $1,000,000 residential hotel of Pacific Mills, Ltd., was officially opened July 31, by the Honorable E. T. Kenney, provincial Minister of Lands and Forests and Acting Minister of Labor for British Columbia.

A part of the comprehensive Ocean Falls community development program undertaken since 1943 when Paul E. Cooper, now president, assumed leadership of Pacific Mills and its subsidiaries. Martin Inn has been planned, in the words of Mr. Cooper, to provide "the most modern and best employee accommodation for any industrial town in Canada."

Mr. Cooper has stressed, however, that the hotel is only a part of his company's townsite development program, which is still in progress. To date Pacific Mills has completed, or has well under construction, several apartment houses, 41 duplex dwellings, a modern laundry, a 500-seat theatre, a girls' dormitory building, and a doctors' office building. Plans have been laid for the building of nine more duplex family homes in the spring of 1948, and study is being given to a community centre building and complete modernization of the company's department store.

The seven-story, completely fireproof, monolithic concrete 265-room structure, B.C. fourth largest hotel, will accommodate approximately 350 single employees at Pacific Mills' Ocean Falls pulp, paper and lumber mill, and will also serve as a social center for the community of some 2,500 people.

Described as the most advanced type of industrial accommodation yet to be provided in Canada for employees not living in family residences, Martin Inn contains all the amenities and comforts of a first-class city hotel. Its airy and well-furnished single and double rooms have been designed to provide the occupants with the quiet and privacy which could not be achieved in dormitory or bunkhouse types of living quarters, and, so far as is possible, all public services and aids to pleasant living has been incorporated in the building.

These include dining rooms and cafeteria, tavern, beauty and barber shop, banquet hall, ballroom, spacious lounge and covered patio, billiards and games rooms. All public rooms are equipped with forced ventilation systems and have special accoustical treatment. Elevator service has been provided.

The ultra-modern kitchen contains some of the most advanced equipment for scientific food preparation yet to be installed in Western Canada, and its fully mechanical bakery is of sufficient capacity to supply the entire community, as well as the hotel, with fresh bakery products.

Martin Inn has 99,656 square feet of floor area, and its cubic content is 1,045,916 feet.

Construction began on July 29, 1946, the day the original Ocean Falls Hotel, built in 1911, was finally dismantled, and the new hotel was opened almost exactly a year later, a remarkable achievement under present day conditions of manpower and material shortages. General contractors were Northern Construction Company and J. W. Stewart, Ltd.

The name, "Martin Inn," was given the hotel in honor of the late Archie B. Martin, prominent B.C. industrialist, who was Pacific Mills' first general manager at Ocean Falls, and president of the company from 1918 to 1944. Mr. Martin died in San Francisco in June, 1945.

At the opening ceremony, held at 2 p.m. under perfect weather conditions, the Honorable Mr. Kenney was introduced by Paul E. Cooper, Pacific Mills president. He was accompanied by Louis Bloch, San Francisco, chairman of the board of Pacific Mills Ltd., and C. W. E. Locke, resident manager for the company at Ocean Falls.

After a short address, Mr. Kenney cut a white satin ribbon which extended around the hotel's entrance, and declared Martin Inn open. He then registered as the hotel's first guest, following which the register was signed by Mr. Bloch, Mr. Cooper, and William K. Noppe, architect for the building.

With the hotel opened, the party and a large crowd of Ocean Falls residents proceeded to the large mezzanine lounge, where a portrait of the late A. B. Martin was unveiled by Louis Bloch. Mr. Bloch, who first visited Ocean Falls in 1912, and who played an important part in the organization of Pacific Mills in 1915, was introduced by R. H. R. Young, former resident manager at Ocean Falls, and now manager of manufacturing for the company.

Carved in stone below the portrait and above wide fireplace is a simple tribute to Mr. Martin which reads:

"Archie B. Martin — an able executive, whose sturdy character and sympathetic understanding of people created a community spirit at Ocean Falls which is a monument to his memory."

The hotel was then thrown open for public inspection, and for the balance of the afternoon large groups of residents and visitors examined the building from cellar to penthouse.

In the evening a banquet attended by some 250 guests was held in the Martin Inn banquet hall. At this function, C. W. E. Locke, resident manager, was chairman, and speakers were P. E. Cooper, Louis Bloch, the Honorable E. T. Kenney, R. T. Drummond, vice-president of the International Brotherhood of Paper Makers, John Sherman, vice-president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, and Noel Lambert, president of Northern Construction Company and J. W. Stewart Limited.

A feature of the program was the presentation of a Royal Canadian Humane Association certificate for heroism to a 17-year-old Ocean Falls' resident, Arthur Lancashire, Jr. A year ago, on July 30, 1946, young Lancashire rescued a companion, Barry McKay, from drowning, when McKay fell from the Ocean Falls wharf into the propellor wash of a docking steamer. J. A. Young, first vice-president of Pacific Mills, presented the certificate.

The young hero, in addition to the certificate, also received an engraved wrist watch, presented on behalf of Pacific Mills by Mr. Locke.

Three retired associates of Pacific Mills who are living at Ocean Falls were presented with plaques by Mr. Block in recognition of long service. These were Herman B. Arnold, Thomas E. Bushell, and Bert J. Ollett.

Mr. Bloch, who himself received a 35-year Pacific Mills Service Pin from P. E. Cooper, then officiated at the presentation of a number of 30, 25 and 20 year Service Pins to Pacific Mills' employees.

Recipients were: 30-year pins — George S. Barry, Morris Benson, Giacoma Clozza, Edward Lescow; 25-year pins—Guiseppe Cadorin, Alexander M. Charleson, Robert Greenhill, Peter Johnson, Walter H. Marshall, Alexander Morris, James Simpson, Robert H. R. Young; 20-year pin — Frank N. Youngman.

Bag and Paper Group Holds Record Day at Bethpage

NEW YORK—For its thirtieth annual outing the Metropolitan Bag and Paper Distributers Association, Inc., turned out last Thursday something more than three hundred strong to enjoy the super-heated links at Bethpage State Park in Farmingdale. At the climax of a midsummer hot spell, the golf course was able to lure about twenty per cent of those present to come out and get sunburned. The remaining members and guests found shadier spots and less arduous games.

President Louis H. Silfen received many sincere congratulations on the success of the day's program, which he took on behalf of the entire committee on arrangements. H. D. Barshay, counsellor for the association, put in a manful day's labor supervising all of the details, not the least of which concerned the serving of an extra fifty who came in, without reservations for dinner. Some fifty prizes were distributed for golf and other winners of the day and evening events.

Jack Smith Retires

POWELL RIVER, B. C.—W. J. (Jack) Smith has now retired after 23 years of employment in the sulphite department of the Powell River Company. Prior to going to Powell River he was 13 years as a sulphite acid maker with the B.C. Pulp and Paper Company at its Port Alice, B.C., plant.

One Experiment we declined to make

We don't know how long a company can survive on its past reputation alone, and when we took over this famous old company we had no intention of experimenting to find out.

We dug right in.

We cleaned house, literally and figuratively. We installed new equipment, developed new methods of production, gave our employees new incentives, began remodelling, revising, refurbishing.

And now we're all set to engineer, produce, install, and service the custom-built machinery that, in turn, built the reputation of this company among paper makers the world over.

Never in our history have our engineering ability, our manufacturing facilities, and our capacity to produce been better.

It's all been very exciting. But no one knows better than we that it could never have been accomplished without the Moore & White reputation to build on.

So here we are . . . and if you need the equipment and machinery that we are so well set up to design and build for you, contact us immediately. We doubt that anyone can beat us on deliveries.

Moore & White, believe us, is very much alive.

The MOORE & WHITE Company • 15TH STREET AND LEHIGH AVENUE • PHILADELPHIA 32, PA.

CUSTOM-BUILT MACHINES FOR PAPER MAKERS

Kingsbury & Davis Start New Machinery Plant

BOSTON—Temple & Crane, Inc., have been awarded a management contract to build the new plant for Kingsbury and Davis Machine Company at Contoocook, N. H. This company is one of the largest and best known manufacturers of set-up paper box machinery in the country, with a large export business. They are planning a most modern and efficient plant. It will be situated on the outskirts of the town, near where they have been located for over a half a century.

The main building of the new plant will be about 62 x 410, one story, with concrete foundations and floor, steel frame, brick walls, and insulated plank roof, with the office section at the front end. The plan provides an open and uninterrupted manufacturing and assembly area for economical and straight-line production. An additional service wing will provide boiler house, carpenter shop, forge room, toilet facilities, rest and first aid rooms, etc. Special attention is being given to the comfort and convenience of the employees.

The builders have already started work, and it is planned to have the new plant ready for occupancy in November. Robert Becker of Boston is structural engineer, Lyford and Magenau of Concord, N. H., are electrical engineers, and Lockwood Greene Company of Boston, consulting engineers.

Safety Record Wins Jenkins a Citation

VANCOUVER, B. C. — W. D. Jenkins, veteran director of safety in British Columbia's logging industry, has now been cited by the Board of Governors at the ninth annual Western Safety Conference in Denver for his outstanding work in accident prevention in British Columbia.

Safety director for the British Columbia Lumber Manufacturers' Association for the past 24 years, Mr. Jenkins was awarded the citation for his "interest of accident prevention accomplishment resulting in the conservation of human life and property." It described him as the "father of organized safety in the lumbering industry in British Columbia."

Mr. Jenkins first went into lumbering in 1906 at Craycroft Island near Alert Bay. Two years later he went to Ocean Falls where he worked in the construction of the sawmill and paper plant now known as the Pacific Mills. It was here that he took up his study of safety work.

Cohoes Carton Plans to Resume Full Operations

COHOES, N. Y. — Rumors that the Cohoes Carton Corporation planned to leave this city were dispelled this week with the announcement that full operations would be resumed in the near future. The management claims that the present suspension is mainly due to a seasonal drop in orders. About 50 persons are employed by the concern in the production of corrugated cardboard boxes, the plant being located on the basement floor of the Oneida Mill Building.

The company began operations here about a year ago after assuming control of the Cohoes Folding Box Company and has undergone enlargement on an extensive scale. The local plant is a subsidiary of the United Paper Board Corporation, Victory Mills, which employs several hundred persons. It was also stated that operations at the latter place are also reduced at the present time although there has not been a complete shutdown. The firm has no intention of abandoning the local plant.

Pennsalt Names Lowdermilk Development Division Head

PHILADELPHIA — Dr. Ford R. Lowdermilk has recently been appointed Supervisor of the Development Division in the Research and Development Department of the Pennsylvania Salt Manufacturing Company.

Dr. Lowdermilk replaced Frank R. Murphy, who recently was appointed assistant production manager in Pennsalt's Manufacturing Department. Before joining Pennsalt, Dr. Lowdermilk was associated with the Barrett Division of the Allied Chemical and Dye Corporation in the Research and Development Department and as the technical assistant to the chief chemical engineer.

During the summer of 1945 he was a member of a group of United States scientists serving as consultants to the Chemical Warfare Service and was sent to Germany to inspect and evaluate the German chemical industry.

Dr. Lowdermilk received his Bachelor of Science degree from the University of Arkansas and his Master of Science degree from Emory University. He received a degree of Doctor of Philosophy from the University of Pennsylvania.

He is a member of the American Chemical Society and the American Institute of Chemical Engineers. Dr. and Mrs. Lowdermilk reside at 5022 Cedar Avenue, Philadelphia.

Two Solvay Branches Acquire New Quarters

NEW YORK—Solvay Sales Corporation, has made known that the New Orleans and Houston branch offices have moved into new quarters in their respective cities. The New Orleans branch is now located at 1107 Pere Marquette Building, Baronne Street, New Orleans 12, Louisiana, and the Houston office of the firm is now established at 1313 City National Bank Building, 921 Main Street, Houston 2, Texas.

Worthington Produces Packaged Power Units

HOLYOKE, Mass.—Worthington Pump and Machinery Corporation, has embarked on a field of production that promises to be a major item in its manufacturing program. By adopting a policy of acting as prime contractor for completely packaged power units in sizes of 500, 1,000 and 2,000 kilowatts, Worthington has introduced a radically new marketing system for steam power equipment. Under this new plan, immediate shipment is being made of two 1,000 kilowatt units to supply power for a coal mine in Turkey.

The Holyoke plant will not figure in this program, since the steam power units are being made at the Wellsville, N. Y., plant of Worthington.

As part of the company's plan, all drawings and instructions are furnished with the pre-assembled power producing units, so that only simple erection operations remain to be performed on the plant site, on a simple concrete mat, a spokesman has disclosed.

Orders for these packaged power units also will be completed soon for supplying power to mills in Damascus, Syria, Tripoli and Lebanon.

Tom Kenny's 73 Wins K-C Golf Trophy

NEENAH, Wis.—There were 175 participants in Kimberly-Clark Corporation's annual men's golf jamboree at Springvale Golf Club at New London, Wis., on Saturday, August 9.

Tom McKenny had a 73 for low gross honors, and Joe Koller, Bill Sensenbrenner and Chet Bland were tied for second low gross score. Norman Janssen, Frank Wiesner and Ed Liebereng tied for the blind bogey award.

Kenneth Wruck received the high gross prize in the afternoon, and the longest drive on No. 2 was credited to Herb Stinski. The nearest-to-the-pin award went to Bill McGuire, and Kenneth Krake had the longest drive on No. 5. The closest approach from off the green on No. 9 was made by Dick Shobleski and Richard Zwickey had the shortest drive off No. 1 tee. Goodfellowship awards also were made.

A roast beef dinner followed the golfing events, and cards were played afterward. Elmer Quayle was general chairman.

Reeves Pulley Names Higgins to Atlanta Post

COLUMBUS, Ind.—Frank M. Higgins has recently been appointed the new manager of the Reeves Pulley Company branch office in Atlanta, Ga.

Mr. Higgins has been directly associated with the design and installation of Reeves Variable Speed Equipment for the past fourteen years, spending a number of years as assistant to our chief engineer and the last three years as a sales engineer working out of the home office in Columbus.

Where wet strength counts–

High wet strength of UFORMITE-treated paper is graphically shown by the fact that this paper bag when filled with water does not break even on prolonged soaking.

Photo courtesy Union Bag and Paper Company.

–count on UFORMITES 467 and 470 to do the job efficiently, economically!

Paper bags are just one of many applications where wet strength is of prime importance . . . and in which you can rely on the UFORMITES to give you superior wet strength efficiently and economically.

UFORMITE 467 is particularly designed for use with Kraft by beater addition. UFORMITE 470 is recommended for sulfite stocks—can be used effectively with Kraft, rag and groundwood —in stocks where low acidity is important.

Neither UFORMITE 467 nor UFORMITE 470 affects the color, odor or taste of paper No special handling is needed . . . no special equipment is required to prepare these urea formaldehyde resins. And—as little as 1% resin solids on dry fibre weight will increase wet strength by as much as 300%!

In addition to giving your paper high wet strength properties, UFORMITE 467 and UFORMITE 470 will improve dry tensile and Mullen, fold, uniformity of sizing, and coating surface characteristics. Why not improve the quality and value of your paper at low cost? Write for full details

UFORMITE *is a trade-mark, Reg. U. S. Pat. Off.*

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THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

IMPORTS

NEW YORK IMPORTS

WEEK ENDING AUGUST 16, 1947

Newsprint .....3253 rolls
Printing Paper .....427 rolls
Wrapping Paper .....113 rolls
Kraft Paper .....225 rolls
Cellophane Paper .....3 drums

NEWSPRINT

Aurora Beacon News (Aurora, Ill.), Ogelthorpe Victory, Antwerp, 60 rolls.
Manufacturers Trust Co., Ogelthorpe Victory, Antwerp, 163 rolls.
H. G. Craig Co., Kermic, Donnacona, 357 rolls.
R. A. Olsen, Inc., G.D.D., Donnacona, 354 rolls.
International Paper Co., International No. 1, Gatineau, 302 rolls.
R. A. Olsen, Inc., G.T.D., Donnacona, 366 rolls.
H. G. Craig Co., A.C.D., Donnacona, 372 rolls.
R. A. Olsen, Inc., Donpaco, Donnacona, 363 rolls.
N. Y. Times, George Weems, Kotka, 653 rolls.
Herald Tribune, George Weems, Kotka, 263 rolls.

PRINTING PAPER

Newsday, George Weems, Kotka, 427 rolls.

WRAPPING PAPER

A. George Lutz, George Weems, Gothenburg, 113 rolls.

KRAFT PAPER

Kary Saft Paper Bag Co., George Weems, Gothenburg, 138 rolls.
General Gummed Products, Inc., George Weems, Gothenburg, 87 rolls.

CELLOPHANE PAPER

R. Wilson Paper Corp., Santa Sofia, Barranquilla, 3 drums.

RAGS, BAGGINGS, ETC.

Royal Manufacturing Co., Burckel, Antwerp, 216 bls. cotton waste.
Hanson & Orth, Exceller, Oran, 1 bl. paperstock.
Manufacturers Trust Co., Exceller, Genoa, 250 bls. bagging waste.
D. Benedetto, Coastal Delegate, Havana, 64 bls. rags.
E. J. Keller Co., Inc., Pierre Victory, Antwerp, 46 bls. old heavy burlap bagging.

GLUESTOCK

John Gorvers Co., Santa Sofia, Barranquilla, 279 rolls.
Eastman Kodak Co., Antinous, Rotterdam, 20 bls. pickerwaste.

WOODPULP BOARDS

Jay Madden Corp., George Weems, Kotka, 645 rolls (solid white).
National City Bank, George Weems, Kotka, 165 bls. (solid white).
Jay Madden Corp., George Weems, Helsingfors, 10 rolls.

PORTLAND IMPORTS

WEEK ENDING AUGUST 16, 1947

(———), Stephen Smith, Kemi, 405 bls. prime unbleached kraft sulphate pulp; 3375 bls. prime extra strong unbleached sulphite pulp; 2130 bls. light & strong prime unbleached sulphate pulp.

BOSTON IMPORTS

WEEK ENDING AUGUST 16, 1947

Gottesman & Co., Inc., Goonawarra, Gothenburg, 2032 bls. sulphate pulp.
(———), Goonawarra, Gothenburg, 163 rolls newsprint; 117 rolls wrapping paper.
(———), Goonawarra, Rauma, 3180 bls. extra strong bleached sulphite pulp; 580 bls. prime bleached sulphite pulp (greaseproof).
Bank of New York, Mathilda Thorden, Karlsborg, 2475 bls. dry chemical pulp.
Central Hanover Bank Trust Co., Mathilda Thorden, Karlsborg, 7429 bls. chemical pulp.
(———), Stephen Smith, Kemi, 310 bls. prime unbleached sulphite pulp; 18525 bls. prime unbleached kraft sulphate pulp; 135 bls. light & strong unbleached sulphate pulp; 970 bls. prime strong unbleached sulphite pulp.
Pulp Sales Corp., Stephen Smith, Topilla, 2990 bls. prime unbleached sulphate pulp.
Gottesman & Co., Inc., Svaneholm, 900 lbs. sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 16, 1947

Pulp Sales Corp., George Weems, Kotka, 4191 bls. white dry mechanically ground woodpulp.
H. Reeve Angel & Co., Inc., George Weems, Kotka, 501 rolls newsprint.
Jay Madden Corp., George Weems, Kotka, 514 rolls solid white woodpulp boards.
Price & Pierce, Ltd., George Weems, Gothenburg, 750 bls. strong sulphite pulp.
Gottesman & Co., Inc., Massilon Victory, 2000 bls. sulphite.

BALTIMORE IMPORTS

WEEK ENDING AUGUST 16, 1947

Gottesman & Co., Inc., George Weems, Gothenburg, 2540 bls. dry sulphate pulp.
Elof Hansson, Inc., George Weems, Gothenburg, 72 rolls cellulose for acetylation.
Gottesman & Co., Inc., Massilon Victory, 2750 bls. sulphite.

NORFOLK IMPORTS

WEEK ENDING AUGUST 16, 1947

E. J. Keller Co., Inc., Pierre Victory, Antwerp, 56 bls. old gunny bagging.
E. Butterworth & Co., Pierre Victory, Antwerp, 108 bls. old bagging.

Australia Places Paper In Administrative Control

WASHINGTON—In a move easing former restrictions on goods from non-Sterling areas, the Australian government has placed under "administrative control" various papers and paper products, among a long list of other items, on which quota restrictions will no longer apply, and which will be subject to individual license.

Affected by the action are paper cones, tubes, bobbins, reels, etc., used in spinning and weaving industries; paper including blotting, cartridge, foil, gummed, in rolls, irrespective of size, and in sheets exceeding 144 square inches in area; carbon and other specially prepared copying papers; stencil papers, certain paperboards, tissues, and papers used in manufacture of specified paper products.

All of these, the Department of Commerce has announced, based on foreign advices, are now under what is termed administrative control, quota restrictions do not apply, and applications for import licenses, in the case of imports from non-sterling sources, will be dealt with individually, on their merits.

Formerly, importation of these and other items in the list, from non-sterling areas, was practically prohibited, no import licenses being issued for them when imported from the United States, Canada, Newfoundland, Hong Kong, or other countries and places not in the Sterling bloc.

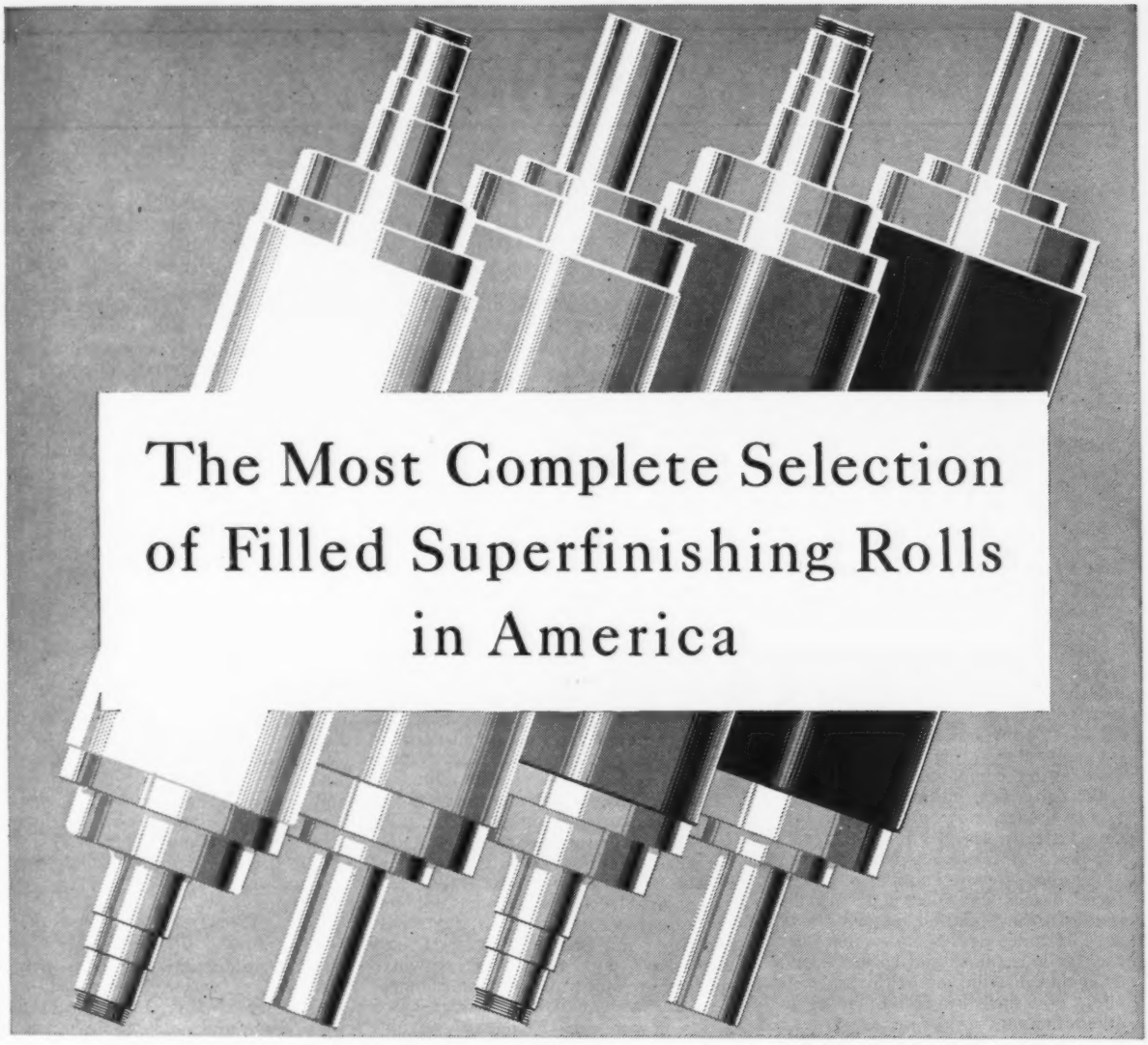
Heath Will Export Paper Machinery

NEW YORK—Formation of the Heath Company, engineers and exporters, has recently been announced by Royal V. Heath, Jr. The company will be engaged in the export of paper making and paper converting machinery as well as handling printing machinery and inks.

Citing a recent Journal of Commerce survey showing only 17 per cent of companies engaged in technical fields avail themselves of export agents, as opposed to 68 per cent for all other manufacturing companies, Mr. Heath pointed out that the ever-increasing industrialization programs abroad have created a widespread need for technical personnel with experience and background in foreign trade.

The Heath Company will offer to foreign purchasers complete engineering services in the procurement of technical equipment and will represent Frank W. Egan & Company, manufacturers of a complete line of Paper Converting Machinery.

Mr. Heath has traveled extensively abroad and was formerly with the Texas Company and Frazar and Company. The new organization will have offices at 150 Boardway.



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Supercalender Rolls

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PACIFIC COAST SUPPLY COMPANY SAN FRANCISCO · PORTLAND

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, August 20, 1947.

Daily average production in June of pulp, paper and board was higher than in May, but because of fewer operating days the tonnage produced was lower. Per capita consumption of paper and board has increased 22.5 pounds over last year despite an estimated increase of over 1,400,000 population between 1946 and 1947. Indications are that with additional pulp and paper making capacity expected to start operating during the last half of the year, overall per capita consumption might reach 350 pounds annually before the end of the year. Sales by paper and paper products manufacturers for the first five months of 1947 were $2,278,000,000; which is $638,000,000 above sales for the same period last year. . . . This sustained demand continues to press manufacturers for prompt deliveries. Shipments of paper towels are showing signs of improvement with carload orders reported being delivered in about four weeks. Mills manufacturing paper towels not sold through distributing companies take longer to make deliveries. Reports indicate that facial tissues, now plentiful in drug stores after a scarcity in 1946, account for much of the toilet paper shortage. Diversion of paper mill machinery to facial tissues and other paper products is said to have caused lingering shortages of toilet tissues and paper towels such as it is. It should be noted, however, that distribution of the scant supplies, governed by freight rates and other factors, results in scarcities in some areas and adequate stocks in others. . . . Out in the Midwest, grocers' kraft paper bags are again in short supply. Shoppers are complaining, and officials of big chains and supermarkets are decidedly unhappy. Principal reason for the shortage is that sales through these types of stores have been increasing faster than the paper industry can supply them with bags. Not all leading bag manufacturers are up to 1941 production on kraft paper bags. Reports indicate the bag industry is about 30 percent behind on deliveries to large users and perhaps 10 percent behind on deliveries to wholesalers and others who supply smaller independent stores.

The index of general business activity for the week ended August 9 declined to 145.1 from 145.5 in the preceding week, compared with 137.8 for the corresponding week in 1946. The index of paperboard production rose to 172.5 from 172.3 in the preceding week, compared with 161.4 for the corresponding week in 1946.

Paper production for the week ended August 9 was estimated at 105.1 percent, compared with 106.1 for the preceding week, with 103.4 for the corresponding week in 1946, with 93.0 for 1945, with 91.2 for 1944, and with 92.4 percent for the corresponding week in 1943.

Paperboard production for the week ended August 9 was 97.0 percent of capacity, compared with 99.0 percent for the preceding week, with 96.0 for the corresponding week in 1946, with 94.0 for 1945, with 96.0 for 1944, and with 98.0 percent for the corresponding week in 1943.

The Forest Service of the U. S. Department of Agriculture is advertising for bids for the sale of 1,500,000,000 cubic feet of Alaska national forest timber. This timber is intended for the manufacture of pulp and paper and requires the building by the purchaser of a 20 to 30 million dollar pulp mill in the Tongass National Forest. The proposed sale is the first of a number planned to support the development of several similar mills and dependent communities in Southeast Alaska. . . . The area cuts across the central part of the Tongass National Forest from near the British Columbia line to Chatham Strait. Petersburg, about in its center, is approximately 110 miles southeast of Juneau and 130 miles southeast of Ketchikan. The commercial timber is within six or seven miles of navigable tidewater, with about three-quarters of it within 2½ miles. Suitable plant and town sites on deep water bays, with adequate fresh water sources for mill processing and domestic use are available. Undeveloped water power sites to power the mill exists at several places in the sale area. Natural waterways can be used for towing lows from logging areas to the mill. The climate reportedly makes practicable a 10-month logging season and plant operation throughout the year. . . . Of the 1,500,000,000 cubic feet of commercial timber in the sale area, enough to run a mill with a capacity of 525 tons per day for 50 years, about 75 percent is estimated to be western hemlock, and 25 percent Sitka spruce, with small quantities of intermixed Alaska and western red cedar. The timber is said to be well suited to pulp manufacture, and about 15 percent is estimated to be more valuable for lumber, plywood, shingles or piling.

Despite newsprint regulations, British newspapers are operating at a circulation of 20,000,000 daily, compared with 26,000,000 in 1938. Newsprint consumption has dropped from 1,296,000 tons in 1938 to an allotment of 320,000 tons for this year. The English press despite smaller newspapers is operating at a profit through linage rates that run as high as £50 per inch. Advertising budgets of English firms are down about 25 percent this year. Some firms placed their greatest billing last year, while English billing as a whole was off about 30 percent. . . . India expects within the next two years to have a newsprint plant equipped to supply a major share of her requirements at a price considerably below the cost of the imported material. The plant, with a daily capacity of 100 tons, will make use of a hitherto unexploited Indian "broad-leaf" tree instead of the usual spruce. The company, National Newsprint and Paper Mills, Ltd., expects to sell its product in India at a price which will be about 60 percent of the landed cost of Canadian newsprint. Indian imports of newsprint total 40,000 tons a year, with an estimated potential demand of 90,000 tons. . . . The paper industry of Czechoslovakia in April was working at 67 percent of its production capacity, compared with 90 percent in 1937, according to the Czechoslovakia Ministry of Foreign Trade. Of the 40 paper mills in the country, 26 are nationalized, 10 are under national private administration, and 4 are privately owned. Paperboard mills number 46, of which 11 are nationalized, 23 under national private administration, and 12 privately owned. All of the country's 17 cellulose mills are nationalized.

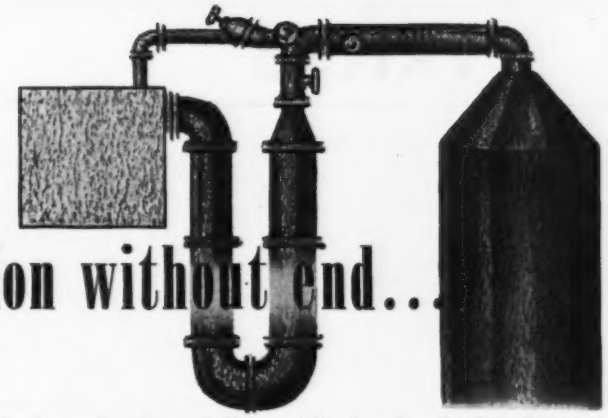
Wood Pulp

June production of wood pulp at 994,544 tons, was 46,968 tons below the record set in May, but it was 95,482 tons above the comparable figure for June 1946. Consumption of wood pulp in the manufacture of paper and board during the month amounted to 1,091,231 tons, 54,521 tons below the figure for May.

Receipts of wood pulp at paper and paperboard mills, although below those of the preceding month, were sufficiently in excess of consumption to add 18,808 tons to the month-end inventories at the paper and paperboard mills. Inventories of wood pulp at pulp mills were increased by 8,269 tons during the month. Most of this increase was in pulp held for own use.

Rags

There are indications of increased production of new cotton cuttings in preparation for shipments this Fall. Activity, however, is still limited with paper mills taking up most offerings at top prevailing levels. White shirt cuttings remain at $11.50 to $12 per 100 pounds delivered to mills plus dealer's commission. Light Silesias are $7.50; unbleached muslins $11.50 to $12. Washables are $4 and light percales $6 to $6.50.



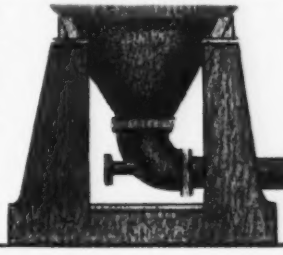
Chlorination without end...

After the introduction of direct chlorination by Hooker engineers and technologists, they then tackled the problem of substituting a continuous process for the batch system of operation. The major obstacle to this change-over was obtaining materials of construction that would stand up under prevailing acid conditions.

Pulp chlorinating equipment of rubber-lined iron and steel proved economical and durable. The design of this equipment was followed in 1931 by the introduction of another Hooker contribution, a rubber-lined mixer based on the baffle principle. The first installation was at Muskegon, Michigan, where it successfully handled 30 tons a day on a continuous basis.

With these improvements the Hooker Chlorination process was now practically automatic and served as a test for chlorine demand. Correct operation for any given grade of pulp resulted in a uniform concentration of residual available chlorine at the end of the acid period. Occasional tests of the chlorinated stock were sufficient and variations in chlorine demand were taken care of by varying chlorine flow so as to maintain a uniform concentration of residual chlorine.

From these early improvements, pulp and paper makers have made greater and greater progress. Hooker chemists and technologists have continued to work hand in hand with the industry on these developments. Along with this co-operation is the help they give in continuing to provide uniform high quality chlorine, caustic soda and the other chemicals without which no lasting progress can be made. Other helps are in the form of informative literature. A list of the bulletins available will be sent you when requested on your company letterhead.



2804

HOOKER CHEMICALS

HOOKER ELECTROCHEMICAL COMPANY
6 UNION STREET • NIAGARA FALLS, N. Y.
New York, N. Y. • Wilmington, Calif. • Tacoma, Wash.

Caustic Soda Muriatic Acid Sodium Sulfide Paradichlorbenzene Chlorine Sodium Sulfhydrate

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—
Roll, contract ....$87.50 to $90.00
Sheets .....$109.00 " —

Kraft—per cwt.—Carload Quantities

Zone A, Delivered
40 lb. base weight

Superstandard Wrapping	$7.00	to	—
No. 1 Wrapping...	6.50	"	6.75
Standard Wrapping	6.00	"	6.25
Standard Bag	5.75	"	6.25

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd....	$1.65	to	$1.72
Wh. No. 1 M. G.	1.65	"	1.72
Wh. No. 1½.....	1.48	"	—
Wh. No. 2	1.55	"	—
Kraft Anti-Tar ..	13.85	"	—
Kraft Unbl.	1.85	"	—
Manila No. 2	1.62	"	—

Toilet—Per Case of 100 rolls—1 M Sheets.

Unbleached	$5.50	to	$6.40
Bleached	6.50	"	7.60

Paper Towels—Per Case of 3750—Zone 1.

Wh. Jr. M'tif'd 9¼x9½	$4.85
Br. Sr. M'tif'd 10x12	3.45
Br. Jr. M'tif'd 9½x9¾	2.95
Br. Jr. Sgl. fold 10x10¾	3.10

Manila—per cwt.—C. l. f. a.

No. 1 Jute Tag	$13.80
Reg. Jute Manila	13.25
No. 1 Manila	9.75

Boards, per ton—

News $92.50	"	—
Chip 90.00	"	—
Sgl. Mla. L1 Chip*102.50	"	—
White Pat. Coated*120.00	"	—
Kraft Liners 42 lb. 95.00	"	—
Binders Boards ..126.00	"	—

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1: Rag Content Bonds and Ledgers—

White, Assorted Items
Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$55.00	$50.00	$48.00
100% Rag	46.50	43.00	41.25
75% Rag	35.00	32.50	31.50
50% Rag	31.50	28.75	27.50
25% Rag	28.00	25.50	24.50

Ledgers, per cwt.

100% Rag Ext. No. 1	$54.25	$50.00	$48.00
100% Rag	46.25	42.50	40.75
75% Rag	36.00	33.25	31.75
50% Rag	31.00	28.00	27.00
25% Rag	27.25	24.75	23.75

Sulphite Bonds and Ledgers—
White, Assorted Items
Bonds, per cwt.

No. 1	$19.25	$17.50	$16.80
No. 2	18.25	16.50	16.00
No. 4	16.75	15.25	14.50

Ledgers, per cwt.

No. 1	$20.25	$18.35	$18.60
No. 2	19.25	17.50	16.80
No. 4	17.75	16.25	15.50

Free Sheet Book Papers—
White, Cased Paper

(Per cwt.)	Case	Ton
No. 1 Glossy Coated...	$19.40	$18.60
No. 2 Glossy Coated...	18.15	17.35
No. 3 Glossy Coated...	17.65	17.00

(Per cwt.)	Case	Ton
No. 1 Antique (Water marked)	$15.90	$15.25
No. 2 Offset	16.00	14.75
A Grade E. F.....	13.90	13.30
A Grade S. & S. C.....	14.40	13.70
B Grade E. F.....	Nominal	
B Grade S. C.....	Nominal	
C Grade E. F.....	Nominal	
C Grade S. C.....	Nominal	
D Grade E. F.....	Nominal	
D Grade S. & S. C.....	Nominal	

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short ADT
Groundwood	$75.00 to $80.00
Unbleached Sulphite.	115.00 " 117.00
Bleached Sulphite ..	121.00 " 125.00
Bleached Soda	115.00 " 120.00
Unbleached Kraft ...	112.50 " 120.00
Southern Kraft	90.00 " 102.50

Canadian mill Prices delivered with freight allowances unless otherwise specified:

	Per Short ADT
Select Unbleached Kraft (no freight allowance)	115.00 " —
Unbleached Sulphite.	115.00 " 117.00
Bleached Sulphite ..	125.00 " 155.00
Glassine Unbleached Sulphite (no freight allowance)	112.00 " —
Bleached Soda	105.00 " 115.00
Groundwood	75.00 " 80.00
Sideruns Pulping News	75.00 " 80.00
Hardwood and Specialty Grades	Nominal

Swedish Quotations
Ex. dock, New York

	Per Short ADT
Bleached Kraft	$150.00 to 156.00
Bleached Sulphite ...	151.00 " 158.50
Unbleached Sulphite..	121.00 " 131.00
Unbleached Kraft	116.00 " 126.00

Finnish Quotations
Ex. dock, New York

	Per Short ADT
Bleached Sulphite	$165.00
Unbleached Sulphite	132.50
Unbleached Sulphite (special grade)	137.50
Unbleached Sulphate	132.50
Unbleached Sulphate (special grade)	159.00

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50 to	$12.00
Light Silesias	7.50	
Unbleached Muslin ...	11.50 "	12.00
White Back Blue Overalls	8.50	
Blue Overalls	7.75	
Unbl. Fancy Shirt....	5.00 "	5.50
Light Percales	6.00 "	6.50
Light Prints	5.25 "	5.95
Washables	4.00	
Bleachable Khaki	6.00 "	6.50
Unbleachable Khaki ..	5.50 "	6.00
Cottonades	5.00 "	5.50

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked.....	$4.50
No. 1 Whites Miscellaneous..	4.25
No. 2 Whites Repacked.....	4.00
No. 2 Whites Miscellaneous..	3.50
Blue Overalls	3.75
Thirds and Blues Repacked..	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags.....	1.35
No. 2 Roofing Rags.....	1.25
No. 3 Jute Bagging.....	1.15
No. 4 Brussels and hard back carpets	1.15
No. 5A Roofing Rags.....	1.15

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.
New Dark Cuttings....	$6.00 to —
New Mixed Cuttings...	6.50 " —
Light Silesias	9.00 " 10.00
Light Flannelettes	8.00 " 9.00
New White Cuttings ..	13.00 " 15.00
Fancy Shirt Cuttings...	9.00 " 10.00
Light Prints	8.00 " 10.00
Bleachable Khaki, No. 1	7.00 " 7.50
Unbl. Khaki, No. 1....	6.25 " 6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.
No. 1 White Linens...	$14.00 to 16.00
No. 2 White Linens...	12.00 " 13.00
No. 3 White Linens...	8.00 " 9.00
No. 4 White Linens...	8.00 " 9.00
No. 1 White Cottons...	10.00 " 12.00
No. 2 White Cottons...	8.00 " 9.00
No. 3 White Cottons...	6.50 " 7.00
No. 4 White Cottons...	5.00 " 5.50
Extra Light Prints....	7.50 " 8.00
No. 1 New Light Prints	6.25 " 6.75
Med. Light Prints.....	5.25 " 5.75
Dutch Blue Cottons....	5.25 " 5.50
Checks and Blues.....	4.00 " 4.25
Linsey Garments	3.00 " 3.75
Dark Cottons	2.50 " 3.00
Old Shopperies	2.50 " 3.00
New Shopperies	2.50 " 3.00

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1..	$4.75 to 5.00
Domestic Gunny, No. 1	4.25 " 4.50
Light Wool Tares.....	4.50 " 4.75
Heavy Wool Tares.....	4.75 " 5.00
Bright Bagging	4.25 " 4.50
Foreign Manila Rope...	6.00 " 7.00
Domestic Manila Rope	5.75 " 6.50
Jute Strings	4.50 " 5.00
No. 1 Sisal Strings ..	5.50 " 6.00
Mixed Strings	1.75 " 2.50

Waste Paper

Prices to Mills
(Dollars Per Ton)
F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$120.00 to $130.00
No. 1 Hard White Envelope Cuts	100.00 " 110.00
No. 1 Hard White Shavings, unruled..	100.00 " 110.00
No. 1 Hard White Shavings, ruled ..	90.00 " 100.00
Soft White Shavings, one cut	100.00 " 110.00
No. 1 Soft White Shavings	85.00 " 95.00
Soft White Shavings, Misc.	65.00 " 75.00
No. 1 Fly Leaf Shavings	55.00 " 60.00
No. 2 Fly Leaf Shavings	50.00 " 55.00
No. 1 Groundwood Fly Leaf Shavings	30.00 " 33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)
Mixed Colored Shavings	(nominal)
Mixed Groundwood Colored Shavings...	(nominal)
Overissue Magazines..	(nominal)
No. 1 Heavy Books & Magazines	25.00 " 30.00
Mixed Books	15.00 " 20.00
No. 1 White Ledger.	65.00 " 75.00
New Manila Envelope Cuttings, one cut..	100.00 " 110.00
New Manila Envelope Cuttings	65.00 " 75.00
Extra Manilas	35.00 " 40.00
Mixed Kraft, Env. & Bag Cuttings	75.00 " 85.00
Kraft Envelope Cuttings	100.00 " 105.00
Triple Sorted, No. 1 Brown Soft Kraft.	65.00 " 75.00
New 100% Kraft Corrugated Cuttings ..	75.00 " 85.00
No. 1 Assorted Old Kraft	40.00 " 50.00
New Jute Corrugated Cuttings	27.00 " —
Old 100% Kraft Corrugated Containers.	(nominal)
No. 1 News	16.00 " 18.00
No. 1 Mixed Paper..	15.00 " 17.00
Box Board Cuttings..	16.00 " —
White Blank News...	75.00 " 80.00
Overissue News	(nominal)
Old Corrugated	28.00 " 30.00
Mill Wrappers	22.00 " 25.00

Twines

All Prices Nominal
(F. o. b. Mill)
(Soft Fiber)

Coarse Polished— India	.26	@	.29
Fine Polished— Fine India	.31	"	.35
Unpolished— Paper Makers	.20	"	.26
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33½
Cotton	.70	"	—
(Hard Fiber)			
Mex. Sisal	.21	"	.24
Manila	.33	"	—
(Hemp)			
Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings— New White No. 1..	.10½	@	.11
New White No. 2..	nominal		
Light Silesias	.07½	"	.08
Black Silesias, soft	.06½	"	.07
New Unbleached ..	.10½	"	.11¼
Washable Prints ..	.06½	"	.07
Washable No. 1....	.05	"	.05½
Blue Overall	.07½	"	.08
Cottons—According to grades— Washable Shredding	.03½	"	.04
Fancy Percales ...	.06¾	"	.07¼
New Black Soft....	nominal		
Khaki Cuttings— Unbleachable Cotton Cuttings	.05½	"	.06
Bleachable Cotton Cuttings	.06½	"	.07
Men's Corduroy ..	.05½	"	.06
Ladies' Corduroy ..	.05	"	.05½
Cottonades	.05½	"	.06

Domestic Rags (Old)

(F.O.B. Eastern Shipping Point)

White No. 1—Repacked	4.50	@	5.00
Mixed White	4.00	"	4.25
White No. 2—Repacked	3.50	"	3.75
Thirds and Blues— Miscellaneous	2.25	"	2.50
Repacked	2.75	"	3.00
Roofing Stock— Foreign No. 1.....	nominal		
Domestic No. 1....	2.00	"	2.05
Domestic No. 2....	1.90	"	1.95
Roofing Bagging ..	1.90	"	1.95
Old Manila Rope....	5.75	"	6.00

Bagging

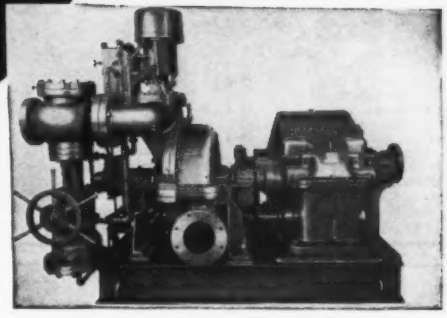
(F.O.B. Eastern Shipping Point)

Gunny No. 1— Foreign	nominal		
Domestic	4.25	@	4.50
No. 1 Clean Bright— Sisal Strings	.04	"	.04½
No. 2 Clean Bright— Sisal Strings	.03	"	.03½
Sisal Jute	.02¾	"	.03
Scrap— No. 1	3.25	"	3.50
No. 2	1.75	"	1.85

Keep within ½ RPM?

THIS

TURBINE DRIVE *can do it!*



The new electric governor used on the Type DE steam turbine has an amazing ability for "seeing" speed variations. It will detect (and correct for) speed variations as minute as 1/10 of one per cent of the set speed, under steady conditions.

This means, if your processing machines are operating at 500 rpm, that the speed will not vary more than ½ rpm. Such accuracy in your drives can really pay off in greater output and improved quality control.

WIDE RANGE

Accuracy is not limited to a narrow speed range. The drive can be operated over speed ranges as great as 30 to 1, with great accuracy of control. Thus the drive gives versatility to your processing machines—enables them to handle special jobs with ease.

SIMPLE CONTROL

Speed is changed easily by simple push-button control. Should an operating cycle require frequent changes in speed, "pre-set" control can be furnished. With this arrangement a separate push-button is provided for each pre-selected speed.

NO HUNTING

The electric governor changes turbine speed smoothly. Hunting, or speed fluctuation, is eliminated.

Our turbine specialists will be glad to show you how this highly accurate, wide-range drive can step up the output of *your* processing machines. Get in touch with the nearest G-E Apparatus Sales Office, or write Apparatus Dept., General Electric, Schenectady 5, N. Y.

GENERAL ELECTRIC

Wool Tares, heavy...	4.00	"	4.25
New Burlap Cuttings	6.00	"	6.50

Old Papers

(F. o. b. Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$115.00
No. 1 Hard White Shavings, unruled..	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News..	60.00	"	65.00
Soft White Shavings.	80.00	"	—
No. 1 White Ledger.	75.00	"	80.00
Ledger, colored	60.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	45.00
Overissue Magazines..	nominal		
New Manila Envelope Cuttings	80.00	"	—
No. 1 Assorted Old Kraft	60.00	"	65.00
No. 1 Mixed Paper..	20.00	"	—
Box Board Cuttings..	20.00	"	—
Kraft Corrugated Cuttings	nominal		
Old Corrugated	30.00	"	35.00
Overissue News	40.00	"	—
No. 1 News	—	"	30.00

BOSTON

Old Papers

(F. o. b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled..	7.00	@	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Misc.	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft.	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News..	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper..	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings..	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers.	1.75	"	—
Old Corrugated Containers	1.50	"	—
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	—	@	4.75
Domestic	—	"	4.75
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads.	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	—	"	4.75
Domestic	—	"	4.87½
South America	5.25	"	—
Wool Tares—			
Foreign	4.75	"	—
Domestic	4.75	"	—
Aust. Wool Pouches..	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging..	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.08	@	—
Fancy Percales	.07½	"	.08
New White No. 1..	.11	"	.11½
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters, Unbleached	.11	"	.12
Silesias No. 1	.08	"	.08½
New Black Silesias..	.05	"	—
Red Cotton Cuttings.	.05	"	—
Blue Overalls	.08½	"	.09
Soft Unbleached	.11	"	.12
Blue Cheviots	.08½	"	.09
Fancy	.06	"	—
Washable	.06	"	—
Khaki Cuttings	.06½	"	.07¼
Corduroy	.03½	"	—
Khaki Canvas	.06¼	"	.06½
B. V. D. Cuttings	.10½	"	.11½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.90	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A..	1.35	"	—
Quality B..	1.20	"	—
Quality C..	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	@	$120.00
No. 1 Hard White Shavings, unruled..	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger..	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News..	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	28.00	"	—
No. 1 News	18.00	"	—
No. 1 Mixed Paper..	12.00	"	—
Old Corrugated	30.00	"	—
Mill Wrappers	22.00	"	—

MARKETS

BLANC FIXE—Supplies adequate to meet steady demand, deliveries fair. Pulp is currently quoted at $55 per ton, in barrels, car lots, at works; and $60 less car lot same basis.

BLEACHING POWDER — Demand easier although supplies continue short. Shipments improved. Quotations are unchanged. Prices on bleaching powder range from $3.00 to $3.75 per 100 pounds.

CASEIN—Current prices on processed acid precipitated casein are quoted around 24 to 26 cents per pound for domestic grades and 28 to 32 cents for imported grades f.o.b. shipping point.

CAUSTIC SODA—Some improvement noted in shipments, but market remains tight. Solid caustic soda is reported at $2.50 to $2.75 per 100 pounds; flaked and ground offered at $2.90 to $3 per 100 pounds, car lots, at works.

CHINA CLAY—Heavy demand continues, supply tight. Domestic filler clay is currently $9 to $11 per ton, car lots. Coating clay is currently $15 to $30 car lots. Imported clay is currently quoted at from $18 to $35 per ton, in car lots, export warehouse.

CHLORINE—Demand remains strong in a tight market. Lack of tank cars continues to hamper deliveries. Quantities unchanged. Chlorine is currently quoted at $2 to $3.50 per 100 pounds.

ROSIN—Gum Rosin in drums per 100 pounds, net, in yard New York, car lots, B, D, E, $8.25; F, G, H, I, $8.50; K, M, N, WG, & WW, $8.55. Wood Rosin, per 100 pounds net, f.o.b., l.c.l. N. Y., B, $6.45; FF, $7.95; G, H, I, K, M, $8.28; N, $8.33; WG & WW, $8.45; X, $8.55.

SALT CAKE—Demand continues strong with slight improvement in shipments. Prices remain unchanged. Domestic salt cake is quoted at $20 to $26 per ton in bulk.

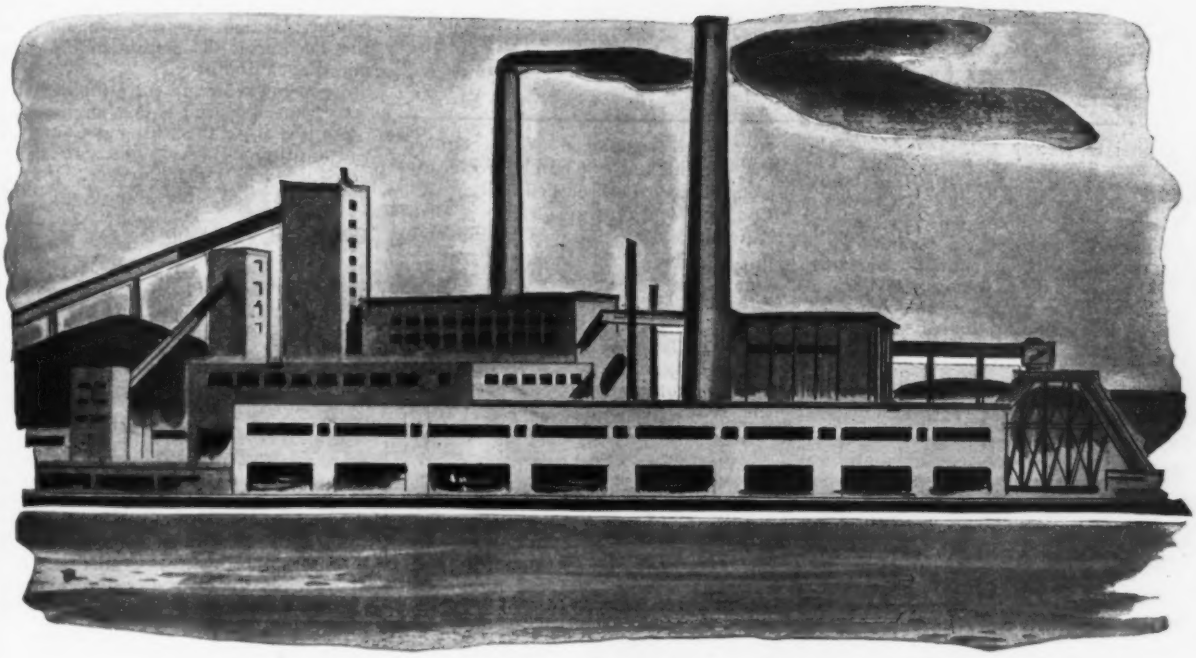
SODA ASH—Demand active with no improvement in the supply situation, previous orders filled. Contract orders prevail at the same high levels. Current prices, car lots, per 100 pounds, are as follows; in bulk, $1.08; in paper bags, $1.20; and in barrels, $1.60.

STARCH—Capacity production absorbed by active demand, export demand eased up. Starch prices continue strong with the pearl grade quoted at $6.37 per 100 pounds; powdered starch at $6.48 per 100 pounds, car lots, Chicago.

SULPHATE of ALUMINA — Active demand covered by fair supplies. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.30 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is quoted at $1.95 to $2.25 per 100 pounds, in bags at works.

SULPHUR— Plentiful supplies to meet active domestic and export demands. Annual contracts are quoted at $18 per ton long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $19.50 per long ton.

TALC—Domestic and French markets have eased up, prices remain steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $35 to $45 per ton. All prices in car lots.



WHAT GOES ON IN THIS PAPER MILL...

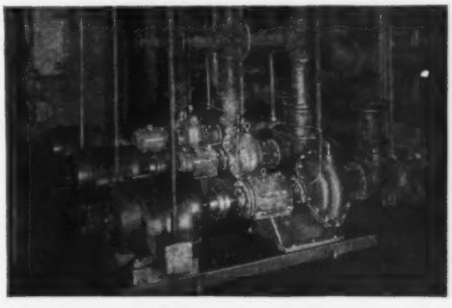
in addition to making paper?

Many paper mills today are *also* turning out chemical by-products of wood . . . such as tall oil, alcohol, resins, turpentine used in the manufacture of soaps, plastics, paints — to name a few. What new kinds of by-products will be made in paper mills of the future can't be said for sure right now.

What *is* certain is that the processing of chemical by-products calls for the right pumps — often specially-developed pumps — such as Worthington builds now . . . and *will* engineer to solve your future problems.

Worthington P.A.E.'s* offer the most in experience and know-how of pump application for all types of pulp and process problems. Worthington offers all types and sizes of centrifugal pumps to *overcome* these corrosion, abrasion, heat viscosity and solidification problems. If you need the right pumps now . . . or will need them, you'll learn that *there's more worth in Worthington* by phoning our nearest office or writing to — *Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.*

*P.A.E.—Pump Application Engineer.



3 of 6 Worthington thin Black Liquor Pumps in the Diffuser House of the North Carolina Pulp Company, Plymouth, N. C.

WORTHINGTON

C4-8

THE WORLD'S LARGEST MANUFACTURER OF PUMPS

Steam | Power | Rotary | Vertical Turbine | Centrifugal

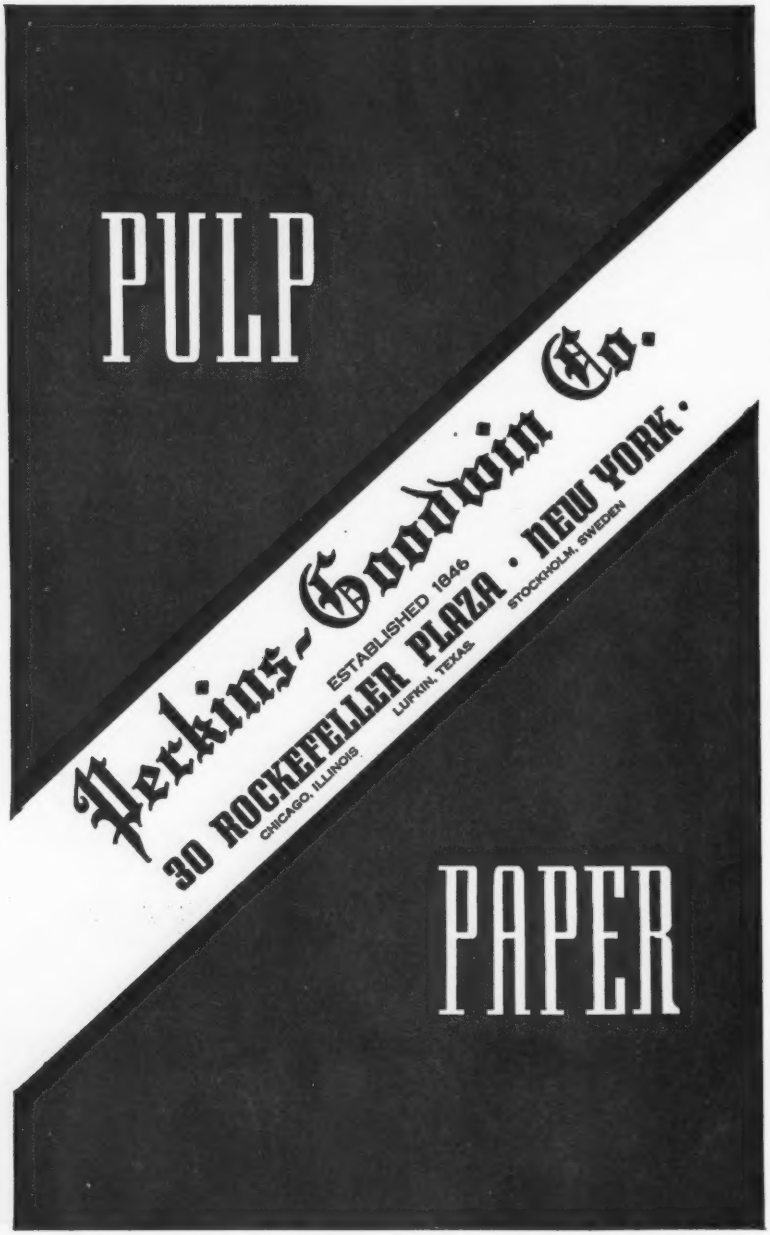
OBITUARY

Arthur G. Ready

SAVANNAH, Ga.—Arthur G. Ready, engineer for the National Container Company, Jacksonville, Florida, died of an appendectomy at St. Joseph's Hospital, Savannah, on Thursday morning, August 14th. Mr. Ready was born at Albany, New York, on December 28, 1895, and was graduated as a civil engineer from St. John's College in 1917.

Following service in the Navy during the first world war, Mr. Ready was successively employed as an engineer by Westinghouse Church, Kerr and Company, W. E. Truesdell, Robert Gair Company and George F. Hardy, all of New York City. He was prominent in the building of the paper mills of the Union Bag & Paper Corporation at Savannah, St. Mary's Kraft Company of St. Mary's, Ga., and the Southland Paper Mills at Lufkin, Texas. He was also manager of the latter two mills. He also constructed and managed the Cia. Industrial de Atenquique at Atenquique, Mexico. He was a member of the Technical Association of the Pulp and Paper Industry.

Upon his return to the United States last year he joined the engineering organization of the National Container Corporation at Jacksonville. He is survived by his wife, Florence. Interment was at St. Mary's on August 16.



George H. Pountain

GLENS FALLS, N. Y.—George H. Pountain, 67, general superintendent of the Hudson River Mill of the International Paper Company of Corinth, and a resident of that place for the last 14 years, died last Friday in the Glens Falls Hospital after a short illness.

A native of Leicester, England, born July 3, 1880, Mr. Pountain was an active member of the Corinth Baptist Church and was widely known throughout the area.

Services were held in the Corinth Baptist Church at 2 p.m. Sunday. After the services the body was sent to Kalamazoo, Mich., for burial in the family plot in Riverside Cemetery.

Mr. Pountain is survived by his wife, Mrs. Helena Pountain; two sons, Clarence, Kalamazoo, Mich., and Frank, Corinth; two daughters, Miss Cora Pountain and Mrs. Ruth Hill of Kalamazoo, Mich.; six brothers, Thomas of Greenville, Mass.; Ernest, LaPorte, Ind.; Arthur, Greenville, Tenn.; William, Wayne, Mich. and Lawrence and Gerald, Kalamazoo; one sister, Mrs. Verne Bonfoey, of Kalamazoo; eight grand children and several nieces and nephews.

Samuel L. Burns

NIAGARA FALLS, N. Y. — Samuel L. Burns, 62, former executive at the Hooker Electrochemical Company and well known industrial figure, died at Memorial hospital where he had been confined for the last five days. He had been in poor health for the last two years.

Mr. Burns was a Hooker employe for 39 years and at the time of his retirement a year ago was head of the combined chlorine departments at the company.

Born at Palmerston, Ont., Mr. Burns came to this city 42 years ago and three years later joined the bleaching department of Hooker as a lime house operator. With the exception of the years 1925 until 1928, when he acted as shift superintendent, he was connected with the chlorine department. In 1928, he was appointed foreman of one of the chlorine departments and several years later was placed in charge of the combined chlorine departments.

Louis LaVeck

ILION, N. Y.—Louis LaVeck, 67, owner and manager of a firm manufacturing plasticized paper drapes in Mohawk, N. Y., died recently in a local hospital following an illness of several months. His wife, two daughters and a son survive.

INTERESTING FACTS ABOUT PAPER!

The human voice can now be recorded on inexpensive paper tape. The tape is coated with an iron-oxide emulsion, can be used over and over, is easily mailed, and can be "erased" by the use of a magnet.

INTERESTING FACTS ABOUT AURAMINE OO

Auramine OO is a basic dyestuff of pure, clear yellow hue. It possesses excellent solubility and is adapted for all types of coloring—beater, calender, dipping and coating. It is extensively used for bond, blotting, cover, tissue, wrapping, news and poster, and boxboard both as a self shade and for topping acid and direct colors to obtain brightness. It is excellent on bleached and unbleached fibers.

Ask your Calco representative for full information about Auramine OO.

CALCO CHEMICAL DIVISION
Heller & Merz Department

AMERICAN CYANAMID COMPANY
Bound Brook, New Jersey

New York • Chicago • Boston • Philadelphia • Charlotte • Providence

General Kennedy Outlines Dominion Forest Policy

(Continued from page 22)

of the social, silvicultural and economic considerations.

"Preparation of a long-term working plan would be the responsibility of the company, to be completed within three years. Approval of this working plan by the Department of Lands and Forests would be necessary before its adoption.

"All forest operating companies should be required to organize along similar lines and all data and returns concerning the forests would be standardized to the fullest possible extent, eliminating the present difficulty encountered in trying to assemble comparative data between regions or operators."

A ten-year trial period is suggested in the report and apparently there would be no compulsion about entering into the project, but priority in the use of waterways for wood transportation is suggested and other similar rights for the forest operating companies. Forest utilization would be conducted under the ablest and best trained woods personnel available within the various groups. Cutting would be carried out in conformity with plans prepared in collaboration with foresters who would protect against jeopardizing future forest conditions for the sake of present dividends.

Mill executives would only need to calculate their wood requirements and send a requisition to the forest operating company in which they hold an appropriate share. Tentative requisition for raw material could be made as of January 1 in each year, to permit the company to plan its season's work. Final requisitions could be made, with the necessary financial adjustment, at August 1, according to the report which further suggests that provision of working capital for the company by means of monthly advances by the operators at agreed rates. When cutting starts the needs of each type of industry would be integrated to the operation of each section of the forest. Materials suitable for poles and ties, sufficient to meet the needs, would be cut into suitable lengths for that purpose. Only straight logs in the larger sizes would be alloted to sawmills. The vexed question of a definition of a sawlog would be solved. It is suggested that nothing under 10 inches, small end diameter, need be diverted to sawmills in order to maintain present production. Priority in regard to timber in any area should go to domestic mills, the report states. Operating companies should deliver wood to their own domestic mills at cost (which would include the fixed dividend on stock). Wood produced for other companies should be permitted to carry a nominal profit over the cost to domestic mills of possibly 50 cents per hundred cubic feet, and wood produced for export should carry a higher rate of profit, possibly $1.50 per 100 cubic feet.

With reference to present labor costs in the forest products industries in Ontario, Major-General Kennedy is of the opinion that they are "arousing consternation among skilled mechanics and professional men who spend years acquiring skills which result in lower earnings." The commissoner agrees that a good bushworker requires skill, intelligence and stamina, equal, if not superior, to that required by most of his opposite numbers in the pulp and paper mills, but the hourly rates now earned by many pieceworkers exceed all but the highest rates paid in paper mills. He suggests joint study by the union, industry and government. He feels that piecework has resulted in many anomolies and much that is detrimental to efficient forest management. Workers naturally want to work in the best stands, leaving the poorer to be worked by day labor.

The report points out that good piecework men need only work 15 to 20 days a month to make an adequate income and that many consider the income tax takes too large a slice of what the worker earns and so ease off their efforts because they do not like "working for the government." The commissioner believes that living conditions are adequate but recommends some brightening and more privacy for individuals and more recreational facilities. He found conditions healthy and comfortable in the camps, but not very attractive. The food was found to be of top quality and, if anything, too rich. He was of the opinion that savings could be made by better cooking and the elimination of waste. The commissioner suggested a much more thorough inspection of smaller camps by the Department of Health.

Major-General Kennedy heard 142 briefs and a half million words of evidence in the 39 sittings he held in various sections of Ontario. Out of all this he has made his report and recommendations. The report suggests a heavy program of road building, jointly agreed upon by the Departments of Highways, Agriculture, Mines, Lands and Forests, and Travel and Publicity, to open up every watershed. Abandonment of the cutting of 8-ft. pulpwood is suggested and the government policy should be inclined in favor of the lumber industry, rather than against it, as would appear from stumpage rates, ground rents and limit allocations of the past decade.

Details are recommended for cutting and a tightening of control over new settlements is suggested. A review of all export and domestic contracts is suggested and a plan outlined for reforesting two and a half millions of acres.

There are many other incidental recommendations and shrewd observations in the report presented by Major-General Kennedy. What becomes of them will depend upon the Ontario government or perhaps upon Premier Drew. There is likely to be disagreement in the industry itself concerning some of the recommendations, but most people agree that something quite drastic must be done to save what remains of Ontario's great natural stands of timber. Many think it almost too late now to accomplish much.

Niagara Introduces New Air Conditioner

NEW YORK—Niagara Blower Company has produced an improved air conditioner designed for highest precision in scientific and industrial applications. Identified as a saturating spray "Type A" machine, it operates on the principle of saturating air with moisture at a given desired dewpoint temperature and then, by re-heating, producing the exact condition of relative humidity and temperature needed in a laboratory, manufacturing or process space, or for impingement on a product as in many continuous drying operations and where uniformity is of paramount importance.

New designs of cooling and heating coils and spray arrangement for great turbulence are said to achieve saturation of air in an exceedingly small floor space. The entire apparatus illustrated occupies 7½ sq. ft. and delivers 2,000 cubic feet of air per minute. Other models requiring up to 50 sq. ft. give air delivery up to 20,000 cubic feet per minute.

The conditioner has a casing of stainless steel welded into an integral unit for the utmost dependability of service under conditions inviting corrosion.

The equipment is recommended for industries and laboratories handling hygroscopic materials, including paper, textile, forest products, photographic film, rayon, cellophane, foods, drugs, instruments, and pharmaceutical chemical and biological processes. It is also used for obtaining the most efficient heat transfer between a liquid in a tube and air by means of evaporation.

Widney Joins Sheppard In Eastern Sales

WORCESTER, Mass.—C. B. Widney, for the past seven years head of the Widney Envelope Company, New York City, has been made assistant sales manager of the Sheppard Envelope Company of this city, in charge of sales in lower New York, New Jersey, Maryland, Pennsylvania and Ohio. His former offices at 25 East 25th street in New York are to be continued. The services of E. A. Cahill and Frank O. DeBlois have been taken over at the same time, Mr. Widney who has been identified with the envelope business since 1929, is widely known in the field, a prominent member of the New York Athletic Club, and active in American Legion affairs.

Where Roll-making EXPERIENCE

Pays Off In PAPER

The knowledge and skill accumulated during nearly a century of roll-making enables Farrel to give every calender roll a clear, hard, chilled surface, *with the skin of sufficient depth to provide maximum wear but not so deep as to detract from the strength of the roll.*

This chilled skin varies in depth from 3/16" in small sizes to 2" in large diameter rolls. It provides an extremely hard, wear-resistant surface capable of taking and holding a smooth, mirror-like finish. The roll strength lies in the gray iron structure below the chill.

In America's largest specialty roll shop at Ansonia, Farrel has the specialized skill and equipment to produce rolls from 5" to 72" in diameter and up to 312" face, ground round and straight to close tolerances, or crowned with the correct shape for specific purposes and operating conditions.

When you need rolls, remember that Farrel rolls assure maximum operating performance and service life. Information and engineering assistance on rolls and other equipment listed here will be supplied without obligation. FB-359

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT
Plants: Ansonia, Derby and Stonington, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Chicago, Los Angeles, Tulsa, Houston, Charlotte.

FARREL PAPER MILL MACHINERY

ROLLS: Chilled Iron, Dry Sand, Meehanite, Alloy Iron, Steel, Chromium Plated
FOR: Calender Stacks
Board Calenders
Super Calenders
Glassine Calenders
Friction Rolls
Breaker Rolls
Smoothing Rolls
Coating Rolls
Creping Rolls
Plater Rolls
Cutting Rolls
Paraffining and Waxing Rolls
Saturating Rolls
Silicating Rolls
Miscellaneous Special Purposes
CALENDERS: Paper and Board
GRINDING MACHINES: Roll
CALIPERS: Roll
GEARS, CUT: Spur, Single and Double Helical (Farrel-Sykes Continuous Tooth Type)
SPEED REDUCING GEAR UNITS
SPEED INCREASING GEAR UNITS
FLEXIBLE COUPLINGS

Farrel-Birmingham

DIGESTED

The Committee also expects to make a study of possibilities of establishing a newsprint and paper manufacturing industry in Alaska on a sound economic basis, but probably not until the new session of Congress convenes. Later in the year it is hoped that the Committee can accept an invitation to investigate and study a recently discovered process by which it appears to be possible to manufacture paper from the scrub oak which grows wild in the southern states, and which has little economic value at the present time.

Committee studies also will be made of several newly discovered processes for de-inking and re-use of waste paper.

Finally, the Select Committee also has on its agenda a thorough study and investigation of the use of newsprint and paper by the various divisions and agencies of the Federal Government with a view to ascertaining whether it may be possible to reduce the Government's use of paper and paper products with a resultant saving to the taxpayers, as well as an increase in the paper supply available for the use of private industry and commerce. There is much evidence to indicate there has been great waste of newsprint and other papers by the Federal Government.—FROM THE REPORT OF THE SELECT COMMITTEE ON NEWSPRINT AND PAPER SUPPLY OF THE HOUSE OF REPRESENTATIVES.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
July 5	62.7	July 6	61.1
July 12	93.5	July 13	95.2
July 19	102.8	July 20	102.8
July 26	106.1	July 27	104.7
August 2	103.9	August 3	105.2
August 9	*105.1*	August 10	103.4

COMPARATIVE MONTHLY SUMMARIES

1946							
Jan.	94.7	June	104.6	Dec.	97.0	Mar.	106.1
Feb.	98.4	July	94.0	Year Avg.	101.1	Apr.	105.1
Mar.	104.4	Aug.	104.7			May	106.2
Apr.	102.7	Sept.	101.3	1947		June	106.0
May	100.7	Oct.	106.4	Jan.	102.1	July	*93.5*
		Nov.	105.5	Feb.	105.9		

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	87.0	94.0	94.2	88.0	87.6	88.1	99.6	*103.6*
Year Average	85.6	97.4	90.4	87.8	88.1	89.4	101.1	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
July 5	78	July 6	70
July 12	76	July 13	87
July 19	97	July 20	94
July 26	99	July 27	95
August 2	99	August 3	98
August 9	*97*	August 10	96

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	91	100	99	94	97	89	99	96	100	99	92	96
1947	99	103	101	100	101	101	*90*						

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

EDITORIAL

Incentive Thinking

There is a good deal more to the subject of incentive wages than material results, whether from the point of view of management or of the wage earner. A heartening reminder of this fact, and a suggestion for an added element was laid before his audience recently by an industrial consultant speaking in New York city. Albert Raymond, head of the Toronto and New York firm bearing his name told representatives of the radio manufacturing industry in their industrial relations conference that much criticism about inventive wages derives from improper interpretation of case histories where the plan is in effect. Most good things can be abused or misused. A medicine may have a high curative value, but when misapplied it may further impair health. Too often hasty and erroneous conclusions are drawn from improper purposes which incentive wages are made to serve.

The basic idea in any wage incentive plan, he argued, should be of providing proper recognition and a legitimate and fair reward for the work done or services rendered.

Incentives used as an inducement rather than a fair and legitimate reward are declared to be objectionable, for such a policy distorts the purpose of the plan and leads to malpractice. The inducement leads to emphasis upon personal and selfish gain by making the idea so tempting that most men and women will not be able to resist it.

An incentive, whether financial or otherwise, says Mr. Raymond, should be measured by its fairness and legitimacy, rather than by its pulling power. Naturally, any fair means of recognition and reward, with or without money, will act as an inducement. They will promote, encourage and stimulate good performance and lead to better results, but our belief in incentive wages is not just because of the lower costs and increased wages. Even if equal results could be obtained in other ways, we would still believe in incentive wages if they provide recognition and a fair reward for the work done or services rendered. In our whole life, we expect recognition and reward to go with accomplishment. We then feel we are treated fairly and justly, like human beings should be treated in a good, decent society.

Some criticism also comes from those who disapprove of monetary incentives. It is an objection directed against what is felt to be too much materialism. To those who hold this view, it will be well to recall the experience of all these war plants whose workers were the fathers, mothers, brothers, and sisters of the soldiers and sailors, who so badly needed the guns, planes, and tanks made in those plants. Sentiment and basic patriotism were the most powerful incentives, but the addition of a financial reward was enormously effective in increasing production in hundreds of these plants.

Actually, wage incentives are only a logical implementation of the desire for fair treatment to labor through legitimate recognition and fair reward for services rendered.

Fresh Energy

Only half of the news about working forces has to do with wage demands and threats of strike. Holidays, and staff picnics, golf tournaments and baseball games both between plants and inside of the organizations, claim their share of the pulp and paper mill industry's personnel news as the summer sun climbs for its annual visit at the top of the thermometer. And who shall say that this news, after all, is not about a highly important and significant portion of the American industrial scene?

In their own way, often as unremarked as it is upobtrusive, the games that America plays have an important part in the production rate that too frequently is matched against the rate of pay and the hours per week of work at the machine. At his games the American has his opportunity to demonstrate his mastery of skills which cater to his self-respect, where too many times his mastery over a machine assumes the guise of service to the machine. He can win over his fellows, or be beaten by a better man, stretch a different set of muscles, demonstrate his prowess before his young son; he can, for the moment, be himself completely and solely. Mostly he feels the good earth under his feet; it's easier to walk on than the wood or concrete factory floor. And it's conducive to a good sound night's sleep, which is the best preparation for a fresh attack on the job next day.

New Sources

Vast as are the production facilities of the United States and of American mills as a continental unit, no contribution is too small to be overlooked so long as demand continues to hold at its present high level. Thus the Import Committee of the American Paper Industry, in a recent bulletin, finds noteworthy the fact that June, among other claims to distinction, recorded first importations of paper from two new sources. From Roumania seven hundred tons of low grade printing paper were received, valued at $100 per ton. Mexico sent its first shipment of fifty tons of m.f. Kraft wrapping, valued at 9½ cents a pound.

W. L. Cook

EDITOR

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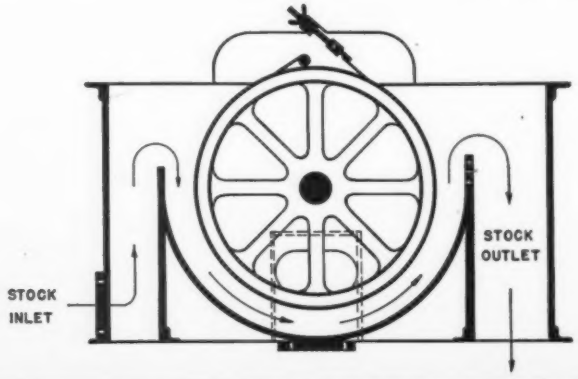

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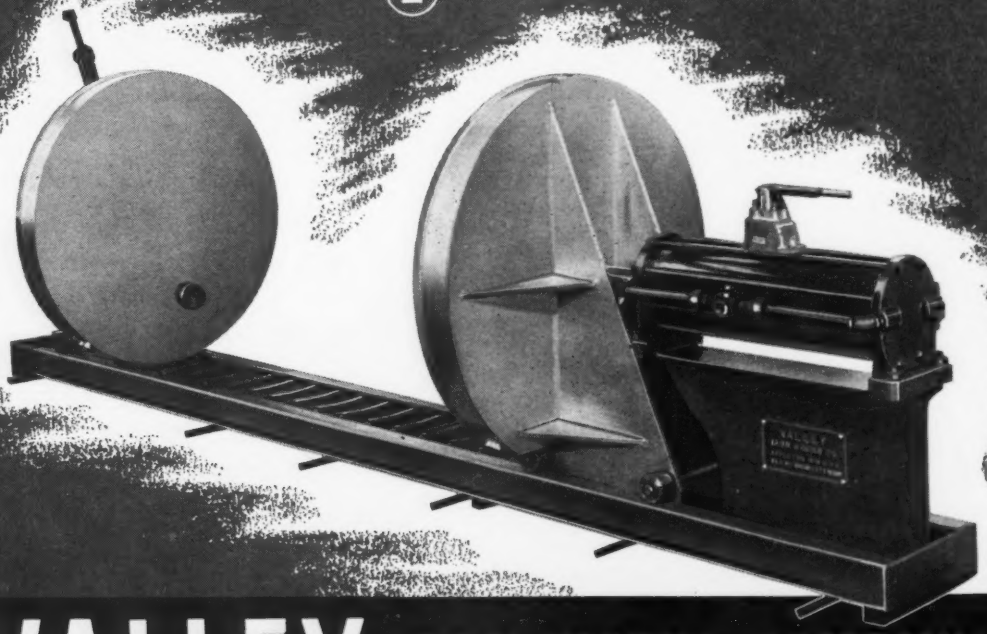

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Influence of Sodium Sulphite and Sodium Thiosulphate in the Sulphate Pulping of Engelmann Spruce*

By Mark W. Bray[1] and Bernard Singer[2]

Abstract

A series of experiments was made at the U. S. Forest Products Laboratory to determine the effects of using sodium sulphide, sodium sulphite, and sodium thiosulphate singly and together in various proportions with caustic soda in the pulping of Engelmann spruce. The data obtained indicated that both sodium sulphite and sodium thiosulphate are active pulping agents when used in combination with caustic soda either to replace part or all of the sodium sulphide in conventional sulphate cooking liquors.

When either chemical was used alone with caustic soda, the strength properties of the pulps were considerably improved over those of pulp made with caustic soda only. These pulps, however, were not so strong as those made with ordinary kraft cooking liquors. When either sodium sulphite or sodium thiosulphate was used to replace half the sulphide present in kraft cooking liquors in such amounts as to maintain the original reducing power of the solution, pulps much superior in strength to kraft pulp were obtained. By doubling the reducing power of sulphate cooking liquor through the addition of either sodium sulphite or thiosulphate to the kraft liquor, some strength properties were increased though they were less than those obtained with liquors of normal reducing power.

These results suggest that the portion of sulphur that, by reaction with caustic soda, forms sodium thiosulphate in the "soda-sulphur" pulping process is not rendered totally inactive but is beneficially utilized as a delignifying agent and in enhancing pulp quality. The work further suggests the possible advantage of using byproduct sodium sulphite as makeup chemical directly in kraft cooking liquors or of diluting kraft cooking liquor with neutral sulphite semichemical spent liquor.

Present chemical processes for the delignification of wood and other fibrous materials for the production of paper pulps depend largely on the action of certain reducing compounds of sulphur, particularly sodium sulphide and the sulphites of basic elements. On the other hand, sodium thiosulphate, which is also present in certain alkaline pulping liquors and which according to oxidation-reduction potential measurements *(1)* should be approximately equal in reactivity to the sulphite, has been considered to be inactive as a pulping agent and even to be detrimental under certain conditions *(2)*. However, Aronovsky and Gortner *(3, 4, 5)* compared the action of water solutions of sodium sulphide, sodium sulphite, and sodium thiosulphate with that of water alone on aspen sawdust and concluded that all three chemicals were "strong pulping agents."

Pulping experiments were made at the Forest Products Laboratory on Engelmann spruce to compare the effect on yield and quality of pulp of interchanging these sulphur reducing agents in strongly alkaline cooking liquors, such as those used in the soda and the sulphate pulping processes. In these experiments, sodium sulphite and sodium thiosulphate were substituted either in whole or in part for sodium sulphide in stoichiometric proportions equivalent to the reducing power of the sulphide component of a typical sulphate cooking liquor. In order to evaluate the effect of the three chemicals, the percentage of free caustic soda with respect to wood charged and its initial concentration, including the sodium hydroxide formed from the hydrolysis of sodium sulphide were adjusted so as to be the same for all digestions. The percentage of total chemicals as well as their concentrations naturally varied because of the differences in molecular weights and reducing powers of the three chemicals studied. Cooking schedules and wood-liquid ratios were made the same for all digestions.

To demonstrate the effect on yield and pulp quality of increasing the reducing power of a conventional kraft digestion, sodium sulphite and sodium thiosulphate were severally added to sulphate cooking liquor (without reduction in the amount of sulphide) in amounts sufficient to double the reducing power of

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[2] Collaborator, Forest Products Laboratory,[3] Forest Service, U. S. Department of Agriculture.

[3] Maintained at Madison 5, Wis., in cooperation with the University of Wisconsin.

the cooking liquor. For comparison, one digestion was made with caustic soda only as the pulping agent. Thus it is possible to show the effect of either fully or partially replacing sodium sulphide with these other reducing agents in kraft pulping as well as to draw conclusions on the effect of the sodium thiosulphate formed in the reaction resulting from the addition of elemental sulphur to caustic soda solution in the soda-sulphur pulping process.

Selection and Evaluation of the Wood

The Engelmann spruce (*Picea engelmannii*) pulpwood used in these pulping experiments, consisting of six 4-foot bolts (Nos. 2, 4, 6, 9, 10 and 12 numbered from the butt) was selected from a single tree cut in Montana. The tree was 145 years old, 102 feet tall, with a merchantable length (7-inch top diameter) of 72 feet. Its crown length and width were 70 feet and 12 feet, respectively. The diameter of the tree at breast height was 16.8 inches (16 inches inside of bark). A sample cord taken from three trees of the shipment is shown in Fig. 1. Table I gives data on the cord measurements. Data on growth characteristics, specific gravity, and chemical analysis of the six 4-foot bolts selected for cooking are also recorded in Table I.

The chemical analysis of the wood indicated it to be in a sound condition and presaged normal yields of pulp on the weight basis, but the comparatively low specific gravity of the wood indicated low yields on the basis of wood volume. The high percentage of spring wood in this material is normal for northern grown conifers and indicates the possibility of relatively high bursting and tensile strength pulps. The presence of compression wood, however, would have some adverse effect on pulp strength *(6)*.

Experimental Procedure

After the wood was chipped, the over- and undersize material was removed on shaker screens. A sufficient quantity of ⅝-inch chips was prepared from the hand-peeled bolts to accommodate all the pulping experiments. The chips were thoroughly mixed and stored in covered cans at 40°F. and 93% relative humidity so that all digestions could be made on uniform material.

The digestions were made with an equivalent of 4 pounds of moisture-free chips in 3.7 gallons (½ cubic foot) capacity spherical, rotary, autoclaves heated indirectly with steam. A linear temperature-increase schedule was followed, allowing 1.5 hours to raise the temperature of the digester from 30°C. to the maximum cooking temperature, 170°C., where it was held constant for 1.5 hours. At the end of the cooking period the pressure in the autoclave was rapidly reduced to atmospheric pressure by releasing steam from the jacket and replacing it with cold water. Spent liquor samples were taken, and the pulped chips were dumped into screen boxes, washed, broken up in a small vat by rapid agitation in water, and screened through a 12-cut flat screen. The screened pulp was pressed, weighed, and sampled for moisture. Data on chemicals charged and consumed, liquor volumes, and pulp yields were calculated to the moisture-free equivalent of chips charged.

In all the digestions the concentration and quantity of free alkali (NaOH) charged, including that of the kraft digestion (No. 1523), in which a part of the caustic soda is derived from the hydrolysis of sodium sulphide, was 50 grams per liter (38.75 grams per liter calculated as Na_2O) and 20 pounds (15.5 pounds calculated at Na_2O) per hundred pounds of moisture-free wood, respectively. In the sulphate digestion, the sulphidity of the cooking liquor was 33.85% of the active alkali present; thus the ratio of caustic soda to sodium sulphide was 2 to 1. This digestion was used as the basis for calculating the reducing power of digestions involving the use of sodium sulphite or sodium thiosulphate.

TABLE I.—PHYSICAL CHARACTERISTICS AND CHEMICAL ANALYSES OF ENGELMANN SPRUCE PULPWOOD

Data for Standard Cord	
Weight of cord: (basis 4-foot unbarked logs, 128 cubic foot gross volume)	
Unbarked, as received, pounds	4,470
Barked, as received, pounds	4,090
Barked, moisture-free (weight barked × percentage non-volatile), pounds	2,235
(solid volume × density), pounds	2,145
Solid-volume of wood in cord as received, cu. ft.	96.7
Number of logs in cord	32
Straightness (basis number logs in cord)	
Nearly straight—less than a deviation of 0.5 inch, %	78
Crooked—greater than a deviation of 0.5 inch, %	32
—average deviation of crooked logs from straightness, in.	0.7
Logs with large protruding knots or bumps (basis total in cord)	none
Knots, average number per log (basis sample logs)—Small	12.2
—Medium	2.4
—Large	0.3
Average Data for Only the Six 4-foot Bolts Used for Cooking Experiments	
Loss through barking:	
In weight (basis unbarked disks, moisture-free), %	7.9
In solid-volume (basis unbarked disks as received), %	6.9
Specific gravity (basis disks, weight when oven dry, green volume)	0.357
Density (basis disks, weight when oven dry) per cubic foot green volume)	22.6
Nonvolatile at 105° C. (basis disks as received)	
Unbarked, %	60.4
Barked, %	61.7
Bark, %	48.9
Diameter: Of barked logs, maximum, in.	14.5
minimum, in.	10.3
average, in.	12.4
Proportion of heartwood to total wood, by volume (Basis disks), %	73.1
Age at stump, yr.	145
Rate of growth, average rings per inch, rings	17.6
Proportion of mild compression wood, by volume, %	15.2
Proportion of summerwood, by volume, %	17.2
Chemical Composition of ⅝-inch Chips	
Cellulose (Cross and Bevan), %	60.5
Alpha-cellulose, %	43.7
Lignin, %	28.9
Pentosans:	
Total, %	12.1
In Cross and Bevan cellulose, %	9.3
Solubility in:	
Alcohol-benzene, %	2.1
Ethyl ether, %	1.1
Hot. sodium hydroxide (1% solution), %	9.2
Hot water, %	1.7
Ash, %	0.3

Chemical Calculations

To maintain the sodium hydroxide-sodium sulphide ratio of 2 to 1, as well as the stipulated percentage and initial concentration of free alkali in the kraft digestion, the following method was used to calculate the concentration and the amounts of each of the two chemicals charged:

If y equals the percentage by weight of caustic soda (or its concentration expressed in grams per liter) and x the percentage by weight of sodium sulphide (or its concentration), for a ratio of 2 parts of caustic to 1 part of sodium sulphide $y = 2x$. According to the equation $Na_2S + H_2O = NaOH + NaHS$, each mole (78 parts by weight) of Na_2S gives, upon complete hydrolysis, 1 mole (40 parts by weight) of caustic soda. Therefore, $40/78\ x + y = 20\%$ free alkali (or 50 grams per liter total concentration of free alkali) in the cooking liquor. Solving the simultaneous equations for x and y, $x = 7.96\%$ Na_2S (or a concentration of 19.9 grams per liter), and $y = 15.92\%$ NaOH (or a concentration of 39.8 grams per liter).

In substituting sodium sulphite and sodium thiosulphate for sodium sulphide, it was assumed that the reducing power of sodium sulphite was equal to that

of sodium sulphide in the ratio of their molecular weights 126 and 78, respectively, and that the thiosulphate had one-half the reducing power per molecule of that of the sulphide and further that no free alkali resulted by hydrolysis of either sodium sulphite or thiosulphate in water solution.

Therefore, 19.9 grams per liter of $Na_2S \times \frac{126}{78} =$ 32.15 grams per liter of Na_2SO_3, and 19.9 grams per liter $Na_2S \times \frac{(2 \times 158)}{78} = 80.6$ grams per liter of $Na_2S_2O_3$.

Description of Pulping Experiments

The following summarizes the digestions made in this work:

Digestion 1520, caustic soda only, using 20% of caustic soda based on moisture-free wood at an initial concentration of 50 grams per liter.

Digestion 1523, a sulphate cook, using the ratio of 2 parts of caustic soda to 1 part of sodium sulphide.

Digestion 1526, an alkaline sodium sulphite cook in which the amount of sodium sulphide used in digestion 1523 was replaced by an equivalent amount (on the basis of reducing power) of sodium sulphite.

Digestion 1527, an alkaline sodium thiosulphate cook, in which the amount of sodium sulphide used in digestion 1523 was replaced by an equivalent amount (on the basis of reducing power) of sodium thiosulphate.

Digestion 1529, a sulphate digestion in which one-half of the amount of sodium sulphide used in digestion 1523 was replaced by an equivalent amount (based on reducing power) of sodium sulphide.

Digestion 1531, a sulphate digestion, with twice the reducing power of sulphate digestion 1523. For this digestion sodium sulphite was added in an amount equivalent to the reducing power of the sodium sulphide used in sulphate digestion 1523.

Digestion 1528, a sulphate digestion in which one-half of the amount of sodium sulphide used in digestion 1523 was replaced by an equivalent amount (based on reducing power) of sodium thiosulphate.

Digestion 1530, a sulphate digestion, with twice the reducing power of sulphate digestion 1523. For this digestion, sodium thiosulphate was added in an amount equivalent to the reducing power of the sodium sulphide used in digestion 1523.

Method of Testing the Pulps

The strength properties of the pulps were determined by testing sheets prepared from material processed in a 1.5-pound standard testing beater according to TAPPI Standard Method, T 200 m-40, which, at the time, specified a 6,500-gram weight on the lever-arm of the bed plate. Bleaching tests were made on the pulps by treating 15-gram samples in a single stage with varied percentages of calcium hypochlorite solution. The color of the bleached and unbleached pulps was measured with a reflectometer calibrated in accordance with TAPPI method, T 217 sm-42. The unbleached pulps were chemically analyzed for their cellulose, alpha-cellulose, lignin, and pentosan contents and for their chlorine requirements

TABLE II.—PULPING OF ENGELMANN SPRUCE (*PICEA ENGELMANII*) BY THE ALKALINE PROCESSES
(Relative Effects of Sodium Sulphide, Sodium Sulphite, and Sodium Thiosulphate)

	Wood [1]		Cooking [2] Data																		
			Chemicals Charged												Chemicals Consumed						
			Concentration						Per 100 Pounds Moisture-free Wood									Black Liquor			
Digestion N	Moisture, %	Weight Moist, lb.	NaOH, g./l.	Na_2S, g./l.	Na_2SO_3, g./l.	$Na_2S_2O_3$, g./l.	Total, g./l.	Total Effective Alkali as NaOH, g./l.	NaOH, lb.	Na_2S, lb.	Na_2SO_3, lb.	$Na_2S_2O_3$, lb.	Total, lb.	Total Effective Alkali as NaOH, lb.	Ratio of Combined to Total Alkali, %	On Moisture-free Wood, %	Total Effective Alkali as NaOH, %	Density at 15° C., ° B.	Total Solids, %	Heat Value of Moisture-free Residue, B.t.u./lb.
1520.....	15.6	4.74	50.0	0	0	0	50.0	50.0	20.0	0	0	0	20.0	20.0	73.2	14.6	14.6	10.5	14.5	7,010
1526.....	14.8	4.70	50.0	0	32.15	0	82.15	50.0	20.0	0	12.86	0	32.86	20.0	72.4	...	14.5	13.7	...	....
1527.....	12.4	4.57	50.0	0	0	80.60	130.60	50.0	20.0	0	0	32.20	52.20	20.0	78.4	...	15.7	17.0	...	....
1523.....	15.3	4.73	39.80	19.90	0	0	59.70	50.0	15.92	7.96	0	0	23.88	20.0	74.8	17.9	15.0	12.6	17.5	6,800
1529.....	12.9	4.60	44.90	9.95	16.08	0	70.93	50.0	17.95	3.98	6.43	0	28.36	20.0	72.8	...	14.6	12.9	...	....
1531.....	13.1	4.60	39.80	19.90	32.15	0	91.85	50.0	15.92	7.96	12.85	0	36.73	20.0	71.6	...	14.3	14.9	...	....
1528.....	12.4	4.57	44.90	9.95	0	40.35	95.20	50.0	17.95	3.98	0	16.15	38.08	20.0	74.8	...	15.7	14.7	1.94	6,100
1530.....	12.6	4.58	39.80	19.90	0	80.60	140.30	50.0	15.92	7.96	0	32.20	56.08	20.0	80.4	...	16.1	17.9	...	....

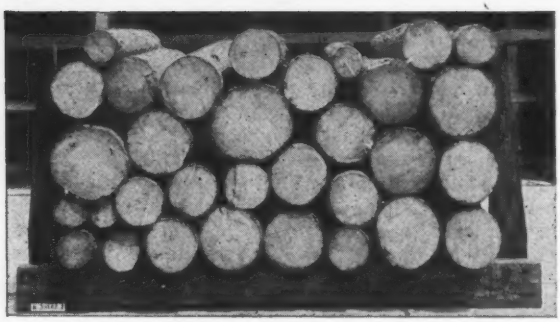

FIG. 1
Racked Cord of Engelmann Spruce Pulpwood

according to standard TAPPI methods (Table II). Bleach consumption and the results of chemical analysis of the pulps are based on the weight of moisture-free pulp tested.

Discussion of Results

EFFECT OF REPLACING ALL THE SULPHIDE OF A KRAFT DIGESTION WITH SODIUM SULPHITE OR THIOSULPHATE

The data reported in the first four digestions in Table II show the effect on yield and pulp quality of sodium sulphide, sulphite, and thiosulphate, in alkaline solution in comparison with caustic soda as the pulping agent. As evidenced by a decrease in both the yield of screened pulp and of screenings as well as the lower lignin contents of the pulps, these compounds increase the rate of pulping in comparison with that obtained by the use of caustic soda solution alone of the same percentage and concentration of free alkali. Of the three chemicals, the sulphide is the most reactive as a pulping agent (compare digestion 1523 with 1526 and 1527), which is in line with their single potentials.

Replacement of all the sulphide of a sulphate digestion with either the sulphite or the thiosulphate slows down the rate of pulping, but increases the rate in comparison with that of caustic soda alone. There is also considerable improvement in all the strength properties of the pulps in comparison with those of the pulp made with caustic soda. For example, addition of sodium sulphite to the caustic soda solution in the proportions previously mentioned resulted, after beating the pulps to a Schopper-Riegler freeness of 700 ml., in an increase of approximately 31% in bursting strength, 17% in tearing resistance, 24% in tensile strength, and 50% in folding endurance. Approximately the same improvement in pulp strength resulted from cooking under the same conditions with sodium thiosulphate in a caustic soda solution. Although the differences are small, the sulphite appears to be slightly more reactive as a pulping agent than the thiosulphate under the conditions employed. Compared at the same freeness (700 ml. Schopper-Riegler), the strength properties of the pulps from the alkaline sulphite and thiosulphate cooks (1526 and 1527) with that made with kraft cooking liquor (1523) of the same reducing power and free alkali content, the kraft pulp was stronger by approximately 10% in bursting strength, 33% in tearing resistance, 28% in tensile strength, and 25% in folding endurance.

There was little difference in the appearance of the several pulps cooked with each of the four chemicals. In general, those obtained from the soda, the sulphite, and the thiosulphate liquors had the appearance and feel in their unbleached condition of the kraft pulp, although the thiosulphate and the soda pulps were slightly darker in color. Although the pulps made with either the sulphite or the thiosulphate had both lower lignin contents and bleach requirements than the soda pulp, the values were considerably higher than those of the sulphate pulp. The results further show that interchanging the several reducing agents in the alkaline cooking liquors had little effect on the pentosan content of the resulting pulps but that it did have considerable effect on both the cellulose and the alpha-cellulose contents. The highest values for the latter constituents were obtained with the cooking liquor containing sodium sulphite.

EFFECT OF THE ADDITION OF SODIUM SULPHITE AND THIOSULPHATE TO SULPHATE COOKING LIQUORS

The remainder of the digestions (1529, 1531, 1528, and 1530) in Table II show the effect on yield and pulp quality of the addition of sodium sulphite and sodium thiosulphate to sulphate cooking liquor. For digestions 1529 and 1528, one-half the sulphide content of the liquor was replaced with the sulphite and the thiosulphate respectively, in amounts equivalent to the reducing power of the sulphide, thus maintaining the total reducing power of the kraft digestion (1523). On the other hand in digestions 1531 and 1530 the reducing power employed in the kraft digestion (1523) was doubled by adding amounts of either the sulphite or the thiosulphate equivalent in reducing power to the sulphide present in the liquor.

According to the pulp yield data, replacement of one-half the sulphide content of sulphate liquor with either the sulphite or the thiosulphate had but little effect on the rate of pulping as compared with the results obtained with straight kraft cooking liquor. The lignin removal, however, was somewhat retarded and consequently the bleach requirements of the pulps in both instances were slightly higher than that produced by the kraft cook. Even doubling the reducing power of sulphate cooking liquor, through the addition of either of these chemicals only slightly increased the rate of digestion. In this instance (1531), sodium sulphite had the greatest effect on the rate of pulping. This chemical produced an easier bleaching pulp with slightly lower lignin content and two percentage points lower yield than that obtained from the sulphate cook (1523).

While the addition of these reducing compounds of sulphur increased the lignin removal when added to caustic soda only, they appeared to retard lignin removal (unless used in excess) when used in combination with sulphate cooking liquor. The use of either the sulphide, the sulphite, or the thiosulphate had little effect on the pentosan content of the pulps, but the sulphite and the thiosulphate appeared to give pulps of slightly lower alpha-cellulose contents.

Of most importance, however, is the marked increase in the strength properties of the pulps resulting from the addition of either sodium sulphate or the thiosulphate to sulphate cooking liquors. This improvement in pulp strength persists even in pulps with bleach requirements lower than that produced with straight sulphate cooking liquor (compare digestions 1531 and 1523). While the use of sodium

sulphite in sulphate liquors gave pulps with all strength properties increased, the most remarkable increases, notably in bursting strength, were obtained when sodium thiosulphate (1528) was used to replace one-half the reducing power of the sulphide. In this instance, with only a 5% decrease in resistance to tear, the following approximate increases in other strength properties over that made by the conventional sulphate process may be noticed: bursting strength, 33%; tensile strength, 17.5%; and folding endurance, 16.5%. Further increases in the percentage and concentration of this chemical (1530), however, resulted in a 1% reduction in yield, a lower bleach requirement of the pulp, and some recession in bursting strength, although there were further, though slight, increases in tearing, tensile, and folding strengths.

Conclusions

The data obtained in these pulping experiments on Engelmann spruce showed that the addition of either sodium sulphite or sodium thiosulphate to caustic soda cooking liquor increases the rate of pulping, reduces the percentage of screen rejects, and improves all the strength properties and bleach requirements of the pulps. However, in conformance with their reducing power as indicated by their single potentials, these chemicals are inferior to sodium sulphide when used alone with caustic soda both as to rate of pulping and quality of product.

The use of these chemicals in combination with sulphate cooking liquor, that is, caustic soda and sodium sulphide, gives further improvement in the rate of pulping and greatly increases the strength properties of the resulting pulps.

From the favorable results obtained with sodium thiosulphate, it may be deduced that any of this chemical formed in the reactions between caustic soda and sulphur in the soda-sulphur pulping process is available as an effective pulping agent and has a beneficial effect on pulp quality. The results also suggest use for the residual sodium sulphite in the spent liquors of the neutral sulphite semichemical process by using the liquor as a diluent for the strong white liquor in the sulphate pulping process.

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4. Ibid., 25, 1349 (Dec., 1933).
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TABLE II.—*Continued*

Digestion No.	Yield Moisture-free Pulp: Screened, %	Screenings, %	Total, %	Test Beater Strength Data on Unbleached Pulp: Time of Treatment, min.	Freeness (Schopper), ml.	Ream Weight (25×40—500), lb.	Burst Factor, points per pound per ream	Tear Factor, points per pound per ream	Tensile Strength, p.s.i.	Solid Fraction, ratio	Folding Endurance, double folds	Stretch, %	Bleaching Data: Standard Bleach Powder Added, %	Brightness, %	Chemical Analysis: Cellulose: Total, %	Alpha, %	Lignin, %	Total Pentosans, %	Chlorine No. (Roe), %
1520	49.7	2.3	52.0	0	880	55.7	0.27	2.27	991	0.23	6	4.3	0	14	86.7	72.2	14.7	8.2	17.4
				40	810	54.2	0.96	1.43	5,706	0.39	400	3.8	25	16					
				60	665	52.4	0.90	1.07	6,421	0.44	359	3.3							
				80	450	52.4	0.85	0.84	7,470	0.49	340	5.3							
				100	315	54.0	0.77	0.67	7,880	0.55	252	4.5							
1526	48.0	1.0	49.0	0	865	53.1	0.42	2.84	1,605	0.28	26	5.3	0	21	87.8	72.6	9.7	8.9	10.2
				20	845	52.1	1.07	1.72	5,747	0.40	759	6.3	25	28					
				40	775	50.9	1.20	1.38	7,315	0.45	643	5.5							
				60	590	49.1	1.20	1.25	8,460	0.50	743	6.1							
				80	385	48.7	1.13	0.93	9,310	0.57	795	6.0							
1527	50.0	0.8	50.8	0	865	53.4	0.46	2.97	1,786	0.29	84	5.3	0	15	86.7	70.4	11.1	8.8	11.5
				20	845	51.3	1.10	1.63	5,877	0.42	894	6.0	25	19					
				40	760	50.7	1.21	1.36	7,056	0.47	598	5.3							
				60	550	49.5	1.20	1.16	9,410	0.52	589	6.8							
				80	340	49.5	1.19	0.88	11,144	0.58	744	10.0							
1523	46.4	0.2	46.6	0	865	50.7	0.64	3.46	2,203	0.30	61	4.5	0	21	94.0	77.2	2.8	8.9	3.9
				20	835	55.3	1.21	2.01	6,645	0.42	1,306	4.8	25	56					
				40	750	50.4	1.30	1.73	9,835	0.46	926	4.3							
				60	580	50.4	1.41	1.35	9,095	0.50	865	5.5							
				80	395	50.4	1.39	1.15	10,711	0.54	1,344	6.0							
1529	45.4	0.1	45.5	0	855	57.0	0.48	3.24	2,798	0.37	....	6.1	0	20	93.7	77.0	4.3	9.8	4.2
				20	840	55.0	1.16	2.13	7,141	0.46	1,120	5.3	25	52					
				40	780	54.3	1.34	1.78	8,945	0.45	1,163	7.3							
				60	645	51.3	1.45	1.51	10,498	0.54	1,069	8.5							
				80	500	52.3	1.57	1.38	11,127	0.53	1,429	9.0							
				100	360	50.7	1.52	1.31	11,881	0.59	1,286	8.4							
1531	44.4	0.1	44.5	0	865	53.9	0.55	3.48	2,284	0.33	136	3.8	0	25	94.6	72.6	2.1	9.0	3.3
				20	840	52.4	1.37	2.03	7,148	0.44	1,170	5.8	25	67					
				40	790	51.0	1.45	1.77	8,279	0.49	1,389	6.1							
				60	655	52.6	1.50	1.62	9,553	0.50	1,184	7.0							
				80	510	50.9	1.47	1.27	12,155	0.54	1,094	8.0							
				100	385	52.1	1.56	1.27	11,860	0.58	1,653	7.3							
1528	46.3	0.2	46.5	0	860	50.9	0.61	3.17	2,185	0.30	375	...	0	17	92.0	72.0	4.8	9.3	5.2
				20	830	50.9	1.32	1.81	7,225	0.39	958	...	25	42					
				40	775	41.6	1.70	1.63	11,567	0.46	1,079	11.3							
				60	600	41.3	1.87	1.22	8,331	0.49	1,177	7.8							
				80	395	40.7	1.82	1.16	11,434	0.54	970	9.0							
1530	45.3	0.3	45.6	0	865	54.8	0.58	3.54	2,406	0.33	128	5.9	0	16	93.1	74.6	3.6	9.4	4.5
				20	835	53.7	1.48	1.99	6,496	0.43	1,322	6.4	25	50					
				40	765	50.1	1.43	1.72	9,935	0.49	844	7.0							
				60	620	51.7	1.47	1.56	10,512	0.50	903	5.9							
				80	470	49.0	1.59	1.16	13,168	0.56	1,175	7.4							
				100	330	51.8	1.61	1.12	13,281	0.57	1,062	8.4							

[1] Tree 3, bolts 2, 4, 6, 9, 10, and 12 from shipment 1561.

[2] All digestions were made in 3.7 gallon, steam-jacketed, spherical, rotary autoclaves heated indirectly with steam.

The cooking conditions other than those shown are as follows:

Weight of moisture-free wood charged, lb.	4.0
Volume of cooking liquor (including moisture in chips) per 100 pounds of moisture-free wood, gal.	48.0
Liquor-wood ratio	4:1
Maximum digestion temperature, ° C.	170
Temperature increase period, hr.	1½
Duration at maximum temperature, hr.	1½

Penetration of Water in Insulation Board*

By William A. Wink[1] and J. A. Vanden Akker[2]

Abstract

The purpose of this investigation was the development of a more satisfactory method for determining the liquid water *resistance of insulation board sheathing. The dry-indicator test which is currently employed to measure this property of insulation board has been found in use to have practical shortcomings and this investigation shows that it is defective from a fundamental point of view. In addition to the highly subjective nature of the test and the indefiniteness of the endpoint, it was found that the hygroscopic nature of the indicator causes the test to be greatly influenced by water vapor. In actual tests performed on samples of insulation board with the dry indicator method, end points (as judged by typical color change) were obtained with specimens which were exposed only to water vapor at high relative humidity.*

A new direct and objective method is described for measuring the water resistance of insulation board. After placing test specimens of the board in contact with water for a predetermined period of time, layers are cut from the specimen in planes parallel to the face of the board. The moisture content of these layers is obtained and compared with the fiber saturation point of the material, which is used as a criterion for judging the depth of penetration of the water.

The resistance of insulation board sheathing to the penetration of water is currently measured by the dry-indicator test *(1)*. This test was developed a number of years ago for evaluating the size resistance of paper *(2-5)* and has been made a standard method of the Technical Association of the Pulp and Paper Industry *(6)*. According to this method, the time of transudation is judged by the change in color of an indicator powder which is sprinkled on the top surface of the specimen, the bottom surface of which is in contact with water. The indicator powder is composed mainly of pure, powdered cane sugar and contains a small amount of soluble starch and Methyl violet dye. The hygroscopicity of the indicator is so great that *water vapor* strongly influences the "end point" of the test—but the end point supposedly signals the transudation of the specimen by *liquid water*. This fundamental criticism of the dry-indicator method developed from a research conducted several years ago on improved methods of measurement of the size resistance of paper *(7)*. A practical defect of the dry-indicator method of considerable importance is the highly subjective nature and indefiniteness of the end point. This defect is pronounced in the application of the dry-indicator method to the testing of water resistance of insulation board sheathing.

The purposes of the present investigation were:

1. Test the validity of the dry-indicator method for the measurement of time of transudation by water.
2. Develop a new method for measuring the penetration of water in insulation board sheathing.

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Methods of Investigation

The study of the dry-indicator method was conducted in two concurrent phases. In one of these, observations with the dry-indicator method were accompanied by tests in which the dry-indicator method was modified in such a manner that the transfer of water from the pool of water to and through the specimen could occur only in the form of vapor. In the other phase, the progress of water through the specimens tested with the normal dry-indicator method was measured directly by means of the method which is proposed later in this report for measuring the penetration of water in insulation board.

Throughout the study, edge effects were minimized by cutting the specimens to a diameter large compared with the thickness, and by sealing the edges of the specimens with wax. In all cases, specimens were cut from 2 × 4-foot samples in the form of disks having a diameter of 6.75 inches.

The edge of a specimen was provided with a ring of wax (50% rosin, 50% beeswax) which served to seal the edge and also provide an accurately flat annular surface of wax to which a plate of glass could be sealed with stopcock grease. A heavy steel template, constructed to facilitate the pouring of this wax ring, is shown in Fig. 1. The specimen, shown in criss-cross hatching, was weighted during the pouring of the wax by an inverted crystallizing dish (170 × 90 mm.), not shown in the figure; this dish was removed after cooling of the wax by running a small spatula around its lower edge. The wax was prevented from sticking to the steel template by the earlier application to the latter of a *thin* film of grease. Easy removal was also facilitated by the sloping surfaces of the template.

After application of the wax ring, the specimen was inverted and the dry indicator was applied uniformly to the top surface with a 100-mesh screen of large area. A thin film of "Celvacene" stopcock grease was applied to the annular surface of wax, and a plate of glass was then laid upon the greased wax surface to seal the indicator from the room atmosphere. The assembly thus formed was floated on water contained in a 9.5-inch crystallizing dish, and the dish was covered with a glass plate to prevent lowering of the water temperature through evaporation. This arrangement is shown in Fig. 2.

The modified dry-indicator test, in which the transfer of water occurs in vapor form, involved the use of the steel template, as described above. However, the 170 × 90-mm. crystallizing dish, previously employed for weighting the specimen during the pouring of the wax, was left in sealed contact with the surface of the specimen. The specimen, with crystallizing dish attached, was removed from the template and inverted. By inserting a small glass tube through a hole previously drilled in the specimen with a number 17 drill, water was admitted to the dish to a level approximately 5 mm. below the specimen; the hole was then sealed with hot wax. Dry indicator was applied as before, and a glass plate laid upon the wax ring to seal the indicator from the room atmosphere. This arrangement is shown in Fig. 3. Care was exercised to prevent contact of the water with the specimen, and subsequent condensation was minimized by arranging

a 100-watt lamp with reflector (ordinary goose-neck desk lamp) approximately 30 inches above the test units. The radiation from this lamp maintained a small temperature differential between the specimen and the water (in effect causing the relative humidity below the specimen to be less than 100%), thereby reducing condensation effects.

The dry-indicator and modified dry-indicator test units were arranged in well illuminated areas. In order that the phenomena of penetration of water and water vapor might be accelerated, the tests were conducted in a room in which the atmosphere is controlled at 100°F. and 20% relative humidity. The rate of penetration of water and the pressure of water vapor are both appreciably greater at 100° F. than at 73° F. (TAPPI standard temperature).

It had been the intention to judge the end point as having occurred when one half of the area covered by the dry indicator exhibited a dark violet color. Observations with the first three specimens tested were based on this criterion, and considerable uncertainty was experienced in determining the end point. Subsequently, the times were noted for *(a)* the first change in color from white to light violet and *(b)* the change in color to a fairly dark violet. These times and their average values were recorded.

The penetration of water in the specimens was determined for a time of contact approximating that required for the color of the indicator to appear dark violet. According to TAPPI Standard T 433 m-44, this time is definitely greater than that corresponding to the recommended end point ("Measure the time interval from the instant of contact of the test specimen with water until the rate of change in the color of the indicator is at a maximum") and, hence, the penetration of water observed in the specimens should have been greater than that corresponding to a change in color lying between light violet and dark violet. In two instances, the penetration of water was determined for intervals several times longer than those corresponding to dark violet.

The penetration of water was studied by measuring the moisture content of the test specimens in different layers ranging from the lower to the upper faces of the insulation board. The layers were arbitrarily taken as those defined by three cutting planes parallel to the faces of the board and equally spaced to provide four layers of the same thickness. Now, when a fibrous cellulosic material is equilibrated in atmospheres of successively higher relative humidity, the moisture content is found to increase with relative humidity in a definite manner (absorption isotherm). As is well known, the physical properties of cellulosic material undergo measurable changes during the imbibiction of moisture as the relative humidity increases. For example, the fibers swell. As the relative humidity approaches 100%, the moisture content attains the "fiber saturation point," which is a rather self-explanatory term. Moisture added beyond this point (as by penetration of liquid water) no longer produces fundamental changes in the fibrous material, but merely fills the capillaries and spaces between the fibers. A criterion for the penetration of liquid water to, and beyond, a given point may, therefore, be found in ascertaining whether the moisture content at that point is in excess of that corresponding to the fiber saturation point.

The foregoing criterion is not exact, since the determination of the fiber saturation point may not be defined or measured with exactness. The vapor tension of water existing in small capillaries and pores (of which there are many in a fibrous cellulosic material) is slightly less than that of unconfined water at the same temperature and, hence, when the relative humidity is 100%, some of the moisture in the material occurs in the small capillaries and pores. (See, for example, the discussion by A. J. Stamm in Wise's "Wood chemistry." Reinhold Publ. Corp., New York, 1944). However, the limits of uncertainty are small relative to the degree of differentiation required in the present study.

The moisture contents in the four layers of a specimen were determined by the following procedure. After the color of the indicator had changed to dark violet, the specimen was removed from the water and sectioned by a power-driven saw. First, a rectangular piece 1.5 × 5 inches was cut from the specimen by the saw. Then, by means of a jig on the band saw, four layers (parallel to the faces of the board), each of thickness slightly greater than 1/8 inch, were cut from the piece. The jig was so constructed that the first cut removed the surface layer of water barrier which had been in contact with the water. Succeeding cuts formed the four layers, and the last cut removed the barrier on the side which had been covered with the indicator. As the layers were removed from the saw, they were placed in tared weighing bottles (size 50/12). The layers were numbered from one to four, layer one having been at the bottom of the specimen, nearest the water. The weighing bottles were removed to the 100°F. room, where they were stored for an interval of 1/2 to 3/4 of an hour prior to the first weighing. The bottles were then opened and placed in an oven maintained at 105°C. and dried to constant weight. The percentage moisture content was calculated on the basis of the ovendry weight.

TABLE I

Sample Number (1)	Conditions: Water at 100° F., Time in Hours, Light Violet (2)	Dark Violet (3)	Av. (4)	100% R.H. at 100° F., Time in Hours, Light Violet (5)	Dark Violet (6)	Av. (7)	Moisture Content of Layers: Moisture Content, % 1st (8)	2nd (9)	3rd (10)	4th (11)	Hours in Contact with H_2O (12)	Equilibrium Moisture Content at 100% R.H. and 100° F., % (13)
*1	...	...	24	...	...	48	13.3	12.3	11.1	10.4	48	34.4
1	...	...	...	...	...	...	90.0	101.0	97.0	90.3	246	
2	15	21	18	39	63	51	17.1	14.5	12.9	11.7	23	33.0
2	...	...	...	...	...	...	99.5	114.0	111.0	86.3	238	
*3	...	...	15	...	...	26	22.9	17.8	16.0	14.6	24	39.4-42.1
4	50	66	58	66	119	93	22.8	16.9	14.7	13.4	71	34.8
5	260	304	282	1098	1266	1182	16.1	14.2	12.8	11.5	310	35.4
6	15	20	18	20	30	25	335.0	272.0	29.7	13.6	20½	37.0
*7	...	...	15	...	...	22	39.7	15.9	12.7	11.3	23	33.0
8	15	28	22	39	63	51	18.3	13.9	12.3	11.4	28	35.5
9	20	41	31	48	96	72	17.4	15.2	14.1	12.9	42½	38.2
10	28	40	34	140	213	177	17.7	15.2	13.5	12.8	42	46.2
11	140	192	166	495	664	580	12.3	11.9	11.5	11.0	192	27.8

* These three samples were the first tested and the end-point was determined somewhat differently from that described in the report for the other samples. The time presented under average in the column heading represents the time required for approximately one half the area of the indicator to reach the dark violet color.

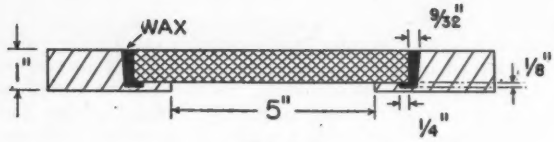

FIG. 1

The sectioning and bottling process is so fast that loss in weight resulting from evaporation to the air is negligible.

Results and Discussion Relative to the Investigation of the Dry-Indicator Method

The results of the investigation of the dry-indicator method are present in Table I. Eleven samples, each comprised of four 2 × 4 foot × 25/32 inch panels of insulation board sheathing, were submitted by eleven different manufacturers of insulation board. The numbers assigned to these samples are given in column 1. In each case, a side of the board evidently suitable for exposure to weather was the surface placed in contact with the water employed in the test. In view of the limitations of equipment and time, only eleven specimens were taken for the dry-indicator test and eleven for the modified test; penetration was examined in thirteen specimens, two of which were placed in contact with water for long intervals. However, statistical aspects, such as sampling, and standard deviation of test results, would not seem to be of importance in view of the exploratory and developmental nature of the work. The times for the appearance of color changes to light violet, dark violet, and the average of these times, are presented, respectively, in columns 2, 3, and 4. Similarly defined times for the modified dry-indicator test, in which the bottom surface was not in contact with water, but exposed only to an atmosphere at 100% relative humidity, are given, respectively, in columns 5, 6, and 7. The moisture contents of the first, second, third, and fourth layers (away from the lower surface) are given, respectively, in columns 8, 9, 10, and 11. The time of contact with water of specimens in which the penetration of water was studied (in most instances, approximately the time for the appearance of a dark violet color in the normal dry-indicator test at 100°F.) is given in column 12. The approximate fiber saturation point of the various materials is given in the last column. In accordance with an earlier discussion, the data on fiber saturation point are slightly high; however, they are no higher than what would ultimately be obtained in the hypothetical case of an insulation board which is perfectly water resistant, yet permeable to water vapor.

Detailed Discussion Of The Test Results For The Normal Dry Indicator Test At 100° F.

Sample 1. After a time equal to *twice* the time corresponding to a change of color of half the area of the indicator to dark violet, the highest moisture content (M.C.) (13.3% in the first layer) was substantially below the fiber saturation point (F.S.P.). Thus, liquid water had not penetrated substantially into even the lowest layer. Not even sufficient water vapor had diffused into the specimen to bring the M.C. to half the F.S.P. After an exposure to water of a specimen for 246 hours (about ten times the end point time), all layers contained water substantially above the F.S.P., and it may be said that water had penetrated the specimen in that exposure of 10 days and 6 hours.

Sample 2. The maximum M.C. of 17.1% (in the first layer), after a time somewhat longer than the interval for dark violet, is much less than the F.S.P. and, hence, liquid water had not penetrated appreciably in the specimen. Complete penetration occured in a specimen which had been in contact with water for about ten days.

Sample 3. The maximum M.C. of 22.9% (in the first layer), after a time 26% longer than that for a change to dark violet of half the indicator, is much less than the F.S.P. and, hence, no appreciable penetration of water had occurred in this specimen.

Sample 4. The maximum M.C. of 22.8% (in the first layer), after a time somewhat longer than the interval for dark violet, is much less than the F.S.P. and, hence, no appreciable penetration of liquid water had occurred.

Sample 5. The maximum M.C. of 16.1% (in the first layer), after a time somewhat longer than the unusually great time of 304 hours to cause the indicator to change to dark violet, is much less than the F.S.P. and, hence, no appreciable penetration of liquid water had occurred.

Sample 6. Liquid water had penetrated the first two layers of this specimen and probably part of the third layer, but not the fourth and top layer after a time somewhat longer than the interval for dark violet. The M.C. for the first two layers (335% and 272%) is far above the F.S.P. and, hence, liquid water had penetrated those layers copiously; they were dark in color (as seen when the specimen was cut) and had the appearance of a material soaked with water. However, only a portion of the third layer could have been penetrated by water, and no liquid water could have penetrated appreciably into the fourth layer; these layers did not appear wet with water, the "front" of the wet layer having appeared near the middle of the specimen. It is estimated that complete penetration of this specimen with water might have occurred in roughly 70 to 80 hours.

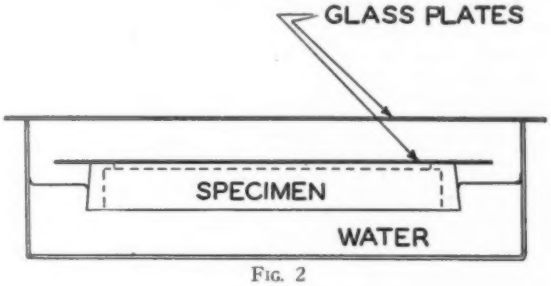

FIG. 2

Sample 7. Liquid water had penetrated the first layer of this specimen (the M.C. of 39.7% is in excess of the F.S.P. of 33.0%) after a time 53% longer than that for half the indicator to change to dark violet, but no penetration as far as the second layer occurred.

Sample 8. The maximum M.C. of 18.3% (in the first layer), after a time required for the indicator to change to dark violet, is much less than the F.S.P. and, hence, no appreciable penetration of liquid water occurred in this specimen.

Sample 9. The maximum M.C. of 17.4% (in the first layer), after a time slightly longer than the interval for dark violet, is much less than the F.S.P. and, hence, no appreciable penetration of liquid water occurred.

Sample 10. The maximum M.C. of 17.7% (in the first layer), after a time slightly longer than the interval for dark violet, is much less than the F.S.P.

and, hence, no appreciable penetration of water occurred.

Sample 11. The maximum M.C. of only 12.3% (in the first layer), after the considerable time of 192 hours for the color change to dark violet, is less than half the F.S.P. and, hence, no appreciable penetration of liquid water occurred.

It is abundantly clear from the foregoing discussion of the data that the dry-indicator test does not evaluate the transudation time for water in insulation board. In nearly all instances, there was little evidence of penetration in the lowest layer, and there was no case in which the water penetrated appreciably more than half the specimen. In the one case (sample 6) where noticeable penetration occurred, it is estimated on the basis of theory (which states that transudation time is proportional to the square of thickness) that the dry-indicator time is only about one-fourth of the calculated time for complete penetration.

The data obtained with the modified dry-indicator test, presented in columns 5, 6, and 7, show that *it is possible to bring about end points without having the specimen in contact with liquid water.* In other words, water vapor plays an important role in the dry-indicator test, a fact which had already been established in the testing of water resistance of paper *(7)*. It would appear that, in the case of water-resistant papers and boards, the dry-indicator test is a *rough* measure of water vapor permeability, for which property the well-known gravimetric test and special tests like that developed by Rowley and Lund *(8)* provide reliable evaluation.

During the course of work with the dry-indicator test, it was noted that the end point was subject to personal error to a degree at least as great as is characteristically the case in the testing of well-sized paper, and that the uncertainty in determining the end point was considerable—probably because of the long times involved. Personnel in testing laboratories have found these objections to the dry-indicator test to be of considerable practical importance.

Before passing to the next section of this report, it seems desirable to mention that the fiber saturation points obtained in this work were determined with the precautions: (1) ample time (about 5 weeks) was allowed for equilibration. (2) The temperature of the room in which the equilibrium was established was controlled within narrow limits, to minimize condensation effects. In a few instances there was evidence of slight condensation, but it was estimated that uncertainty resulting from this cause was of no greater order of magnitude than that due to the influence of capillaries on the depression of the vapor tension. The determinations of F.S.P. were for thin layers taken from the body of the insulation board. The measurements were facilitated by a method recently developed at the Institute for the general determination of moisture sorption isotherms *(9)*.

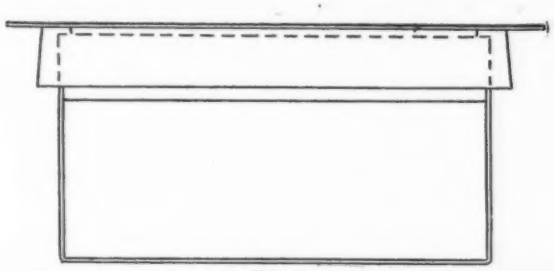

FIG. 3

Discussion of the New Method for the Measurement of Penetration of Water in Insulation Board

The method for direct measurement of the penetration of water in insulation board described in the previous section is proposed for the determination of the water resistance of such board. This method has the outstanding advantage of yielding a direct measurement of the penetration of water, and the additional virtues of being definite and objective.

It is recommended that the method be designed to meet the following conditions:

1. The testing should be conducted in a room or apparatus controlled at standard temperature and relative humidity.

2. The test specimen should be conditioned in the standard atmosphere for 1 week prior to testing. If the work at hand is that of mill control, it will be necessary to overlook this condition; however, in using the method for reference, an adequately long conditioning time should be provided—1 week would seem to be minimal.

3. The test specimen, in the form of a 6.75 inch disk, should have its finished side in contact with water and its reverse side in contact with moving air of the controlled room or apparatus; the temperature of the water should be the same as that of the air above the specimen.

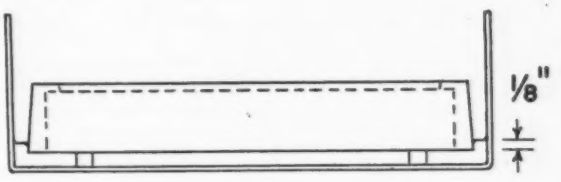

FIG. 4

4. The duration of the test should be a standard time meeting the desiderata of the industry.

5. The sectioning of the test specimen and placement of the sections in weighing bottles should be completed within 6 minutes after removing the specimen from the water. (If the band saw cannot be a part of the testing equipment in the controlled room, but would be available only at some remote point, the specimen should be wrapped in moistureproof paper, and the sectioning and placement completed within 6 minutes after removing the wrapping from the specimen.)

6. After initial weights have been taken, the moisture content may be determined by any one of the several modifications of the gravimetric method. Oven drying at 105° C. of the specimen in the weighing bottle (probably the most common practice) is unnecessarily slow. It will be noted that the theory of the method is such that precision determinations of moisture content are not required. Therefore, accelerated drying methods (temperatures in excess of 105° C. in ventilated ovens, electrically heated curved metal surface against which the specimen is pressed by means of a coarse wire screen, vacuum drying, and so on) should be employed.

EQUIPMENT

In addition to ordinary laboratory apparatus such as analytical balance (or other weighing device of sufficient accuracy), electrical hot plate for heating the rosin-beeswax, etc., a band saw is required. The jig for use with that band saw may be any simple wooden assembly furnishing a movable guide piece

held by a pair of pins fitting in holes in a base plate, so spaced as to give the desired cuts, namely, removal of the surface layers (about 1/16 inch thickness), followed by three cuts yielding the four layers, each of thickness a little greater than ⅛ inch. In addition, the steel template shown in Fig. 1 should be supplied, although the procedure presented below may be followed if the edge of the specimen is carefully dipped in hot wax. The template can be prepared in a lathe by any machinist from a piece of heavy boiler plate.

Procedure

By means of the band saw, a circular disk 6¾ inches in diameter is cut from a sample of insulation board. The specimen is centered in the steel template (Fig. 1) (the latter having been lightly greased) and weighted with an inverted crystallizing dish (170 × 90 mm.). The hot wax is transferred by means of a 50-ml. pipet, or any other convenient device; the pipet should be equipped with a rubber bulb. After the wax has solidified, but is still warm, the crystallizing dish is lifted away, and any wax protruding above the surface of the specimen is neatly trimmed away with a spatula. When the wax is fairly hard, the whole assembly is placed over a thick disk of wood of diameter roughly 4¾ inches in such manner that the wooden disk enters the 5-inch hole in the bottom of the template, and bears against the specimen. A slight downward force is then applied uniformly around the periphery of the steel template to release the specimen and its adhering wax ring.

The specimen is inverted and placed in a crystallizing dish (200 × 65 mm.) which contains such volume of water that, when the specimen rests upon three ¼-inch spacers, the water level in the space between the dish and wax ring is about ⅛ inch above the lower surface of the specimen (see Fig. 4). Nothing is placed over either the specimen or the crystillizing dish. The thickness of the air space between the wax ring and the crystallizing dish should be so small that the temperature of the water under the specimen is not appreciably lowered by evaporation of the water through that air space.

Twenty-four hours later the specimen is removed, excess water is quickly removed from the lower surface and, with the specimen laid flat upon the table of the band saw, two cuts 1.5 inches apart are made to remove a central zone 1.5 inches wide. The circular ends are quickly removed to produce a roughly rectangular piece about 5 inches long. This piece is laid upon either of its long edges and, with the help of the jig, the two surface layers are removed, and then the four layers are obtained by making the remaining cuts. Note should be made of the designations of these layers—that is, layer No. 1 should be that nearest the wet surface, layer No. 2 the next, and so on—and the layers should be placed in tared and labelled weighing bottles (size 50/12). Each layer should be bent back on itself (or broken to fit) before inserting it in its weighing bottle. Moisture-content determinations are then made by the procedure favored in the given laboratory. In any procedure, there should not be appreciable loss of moisture from the material prior to the first weighing, nor should there be appreciable gain of moisture by the material after drying to essentially constant weight; intelligent use of the weighing bottles and speed of action will preclude serious error arising in such loss and gain of moisture.

The moisture contents of the four layers are then compared with the fiber saturation point for the material. A rather arbitrary criterion for *complete* transudation of the specimen may be based on approximate equality of the moisture content of the fourth layer and the F.S.P. This criterion is obviously not exact, but is simple and on the conservative side. Similarly, penetration to and through the *n*th layer may be judged by equality of the moisture content in the *n*th layer and the F.S.P. Intermediate cases will be evident.

It would not seem necessary or feasible to evaluate the fiber saturation point each time penetration measurements are made. Rather, it should be satisfactory to determine the F.S.P. for each insulation board material fabricated by a given manufacturer, and employ the F.S.P. for a number of determinations. At intervals, the F.S.P. may be redetermined to allow for changes in composition and processing variables.

The errors inherent in the F.S.P. method employed for the present purposes have already been discussed. In laboratories where the temperature is not closely regulated, and where such errors might be quite large, it is recommended that the F.S.P. be determined by extrapolation: The moisture content is determined for two relative humidities between 90 and 98% (for example, 92 and 96%) and, by graphical extrapolation, the moisture content at 100% (F.S.P.) is obtained. In this work, sufficient time must be allowed for equilibrium to become established, and measurements should be made on thin layers cut from the body of the board. This time may be several days or longer. During the determination, gain in weight should be plotted against the logarithm of the time (using semilogarithmic paper), and equilibrium is found to exist when the curve so plotted levels out. (Plotting on ordinary graph paper is very apt to be misleading and result in incorrectly low values.) One of the phenomena causing the weight to increase indefinitely is the development of mold on certain specimens at high relative humidity. Some judgment must be employed in ascertaining when the moisture content has attained an essentially constant value.

Accelerated Method

A reference standard method of the sort outlined in the previous section is undoubtedly too slow for the purposes of mill control. The danger of accelerated tests of properties is the possibility of poor correlation with testing under conditions simulating those of actual use. However, an accelerated test is needed for the control of production of insulation board; it is believed that such a test will be of considerable value even though its accuracy is inferior. Accordingly, work on the development of a relatively fast test is currently in progress.

Acknowledgment

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Economics of Straw Utilization*

By E. C. Lathrop[1]

Abstract

A brief outline is given of the development in the use of agricultural residues by the paper and paperboard industries. The future of such usage is also considerated.

Hundreds of new uses for paper, container, and building board products were developed during the war years. Thousands of new uses will result from the intensive industrial research on cellulose now under way. These materials are in short supply even at a present annual production of 19 million tons. The plant expansion program of the paper and board industry involves hundreds of millions of dollars. The present annual consumption of forest products exceeds the annual growth rate. Costs of pulpwood have approximately doubled during the past 5 years because of increases in labor and transportation expenses.

Of the crop residues, wheat, rye, rice, and seed flax straws appear exceptionally well suited to contribute to the manufacture of paper and board. This statement is supported by the following facts:

Use of Straws

Board manufacturers the world over recognize that the highest quality of 9-point corrugating is made from wheat or rye straw. Even before the war, Holland, Belgium, Germany, Italy, South America, and South Africa manufactured fine book, writing, and other papers by pulping these straws. A mill in Java has for many years been producing fine book and writing papers from rice straw. Much of the paper produced in England during the war was from cereal straws. The mill equipment was not well suited for this purpose, and one of the larger English paper companies is now building a mill designed to use wheat straw to make fine book and writing papers. Seed flax straw has proven to be the best source in this country from which to produce cigarette paper and one of the best for condenser, Bible, and certain other fine papers. A satisfactory insulating building board was manufactured for some years from wheat straw in Missouri. Recently, at the Northern Regional Research Laboratory processes for manufacturing building materials of exceptional merit from straw have been developed.

Prior to 1829, paper was manufactured from linen and cotton rags. In that year the first process for making paper from straw was invented, and a mill started operations in Pennsylvania. The first mills producing paper from wood started to operate in the United States during the 1860's. Wood was easier to collect than straw, and better paper for wrapping, bag, and general use could be made from wood than from straw. Shortly after that date the use of straw for papers, other than for butcher paper and board, declined; and almost the entire effort in paper manufacture was directed to the use of woodpulps. However, because of the superiority of straw as a raw material for corrugating board, the strawboard industry in this country has, thus far, withstood the competition of woodpulp. Indeed, until 1926, strawboard had a monopoly on corrugating box manufacture. At that time official freight classifications permitted use of a board made from waste chestnut chips from which the tannin was extracted. A few years later the use of kraft pulp was officially recognized.

At present 25 strawboard plants operate in the Middle West. They use about 700,000 tons of straw, principally from wheat. Most of these plants were built 30 to 50 years ago when farmers were glad to sell their straw stacks and when wheat was a major crop in this area. Furthermore, these plants are located near metropolitan centers where boxes are used. With the changes in farming practice beginning in the 1930's, particularly with the change from wheat to soybeans and other diversified crops, coupled with the introduction of the combine, the strawboard industry has encountered extreme difficulty in straw procurement.

The development of the American cigarette paper industry by Straus and his associates, using seed flax straw as a raw material, is an outstanding achievement in the paper industry. This waste had been investigated numerous times previously, and it was generally considered that economics was against the use of seed flax straw for fine paper manufacture. To Lawrence Dixon, one of the Straus associates, belongs much of the credit for making the process possible—his contribution being that he worked out and effectuated the collection of the straw and its processing into the valuable tow fiber now used for the paper process. This industry started just prior to the war and made possible the tremendous production of cigarettes in this country. Previous to this practically all cigarette paper was imported from France. Several companies in this country and Canada now use seed flax straw, not only for cigarette paper but also for the manufacture of the finer papers such as condenser, Bible, air mail, and the like.

Industrial Problems

The function of the Northern Regional Research Laboratory is to develop the use of farm products, particularly surpluses, to bring a greater dollar return to the farmer. To effectuate industrial utilization, commercial processes must be developed and every aid must be given to industry and to agriculture to establish and maintain mutually profitable business relations. Having had long industrial experience in the development and manufacture of board and paper products and having contributed to the successful industrial methods of collecting, handling, and storing sugarcane bagasse, the author approached the organization of the Agricultural Residues Division of this Laboratory in 1939 from a practical viewpoint. In 1940 a trip was made to each strawboard plant to learn the problems of this industry. Close contact was also established with the new cigarette paper industry. The outstanding problem of these industries

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* Based on an informal presentation made before a joint meeting of TAPPI Fibrous Agricultural Residues Committee and representatives of farm equipment manufacturers (Power Machinery Department of the Farm Equipment Institute) on straw collection and baling, January 13, 1947, at Northern Regional Research Laboratory, Peoria, Ill.

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was the economics of their fibrous raw materials, mainly that of adequate collection.

In 1940 the harvester-combine was finding extensive use in the Middle West and the familiar straw stack was less in evidence on the landscape. For some reason, the development and manufacture of a pick-up baler, the companion machine to the combine, had lagged not only to the discomfiture of the strawboard industry but also, and more important, to the farmer who needed millions of tons of bedding. Furthermore, the methods of collecting and baling combine straw were new, and the quality of this straw was very poor. Consequently, contact was established with members of the Farm Equipment Institute and through cooperation of some of their members and of agricultural experiment stations, a number of valuable experiments on straw collection were conducted. The concurrent importance of developing pick-up balers for hay has resulted in the development of a number of light, one-man pick-up balers. However, the package made by some of these is too low in density for industrial use. It is also evident that present methods and machines for collecting some 350,000 tons of seed flax straw are inadequate.

From the author's talks with executives of the strawboard industry it is known that they recognize that some of their present difficulties arose on their own doorsteps. The old methods of straw procurement resulted in very small return to the farmer. In many cases mills usually had no direct dealings with farmers. When changing conditions came to Midwestern farmers they had no incentive to keep serving industry. Today the mills pay more freight on their straw than they pay the farmer or the straw collector. It is believed that mill executives are remedying this situation and that better mutual understanding between industry and the farmer is being developed.

The strawboard industry recognizes that little research has been carried out and that mill operations will benefit from better operating control. The Northern Laboratory has undertaken to assist the industry in this phase of work and to investigate raw materials other than wheat straw. Some practical progress has been made. At the same time, research directed towards the manufacture of fine paper pulps has yielded results which indicate the possibility of obtaining a yield of 50% of screened bleached pulp based on the original straw. This pulp will be chiefly useful for blending with woodpulp to produce improved magazine, book, and writing paper. Based on some preliminary results given by the Laboratory to Dutch and to English papermakers, the principles of the process have already received industrial application. A Dutch mill is producing more than 100 tons of fine paper a week from straw by the process. The English results are not quite so good, but this is because of lack of proper equipment. One of the American mills is arranging to try out this process before long.

Several groups in both Kansas and Nebraska are giving serious consideration to the use of the Northern Laboratory's process for producing board products. Such development would require the use of about 200,000 tons of straw. Veneer used for making wire-bound boxes is becoming scarce owing to depletion of forests, and expensive because of more profitable uses for such veneer. The Northern Laboratory is cooperating with the box industry in an endeavor to produce a satisfactory box board from straw. Present results are fairly favorable. If this industrial requirement could be supplied from straw as a raw material, another million tons of straw would find use.

From this discussion it will be seen that with some improvement in the economics of straw collection and handling, the day is not far distant when straw can contribute markedly to this rapidly growing board and paper industry. Statistics for wheat straw in 1945 show a total of 63 million tons of straw produced, of which only 3 million tons was baled, although a total of 10 million tons was sold or used on the farm. Thirteen million tons was cut by the binder, much of which was blown into stacks; 21 million tons was uncut stubble standing after combine harvesting. Of course many farmers find use for this straw as stubble mulch or for plowing back into the soil to maintain fertility, but in many areas such practice is of no benefit or other practices are preferred. For example, the Ohio Agricultural Experiment Station now recommends that the standing combine straw stubble be removed at once from legume cover crops. It has been found that this stubble not only degrades the legume hay but also markedly depresses its yield. How much straw was burned or wasted in 1945 is unrecorded. Straw is a national annual resource; its best and most profitable uses should be found.

Naturally, the farm equipment manufacturers have been more concerned with the farmer's problems than with those of industries using farm products. Now with definite prospects of tonnage utilization of certain crop residues it would seem that a broader viewpoint is warranted. In 1940 it appeared to the author that the logical way to develop this mutual understanding of the problem was to arrange for the strawboard and farm equipment industrial representatives to sit down together, define the problems of each group, and find a practical and profitable solution. First, it was necessary for the members of the strawboard industry to consolidate their thinking. This has been done in the TAPPI Fibrous Agricultural Residue Committee. This conference between the TAPPI committee and the Farm Equipment Institute is, therefore, the culmination of long planning. A solution of this particular industrial problem will open the door very wide for greater use of agricultural residues both on the farm and by industry.

The farmer must obviously receive value for his straw. This can be done by reducing transportation costs and by securing better quality straw which will give higher yields and better quality paper. It must be realized that the woods operations in obtaining pulpwood have reached a high state of efficiency in mechanization and labor-saving brought about by many years of intensive study. These operations are almost as highly industrialized as the manufacturing operations in the production plants of the farm equipment or strawboard industries.

If, when the farm equipment manufacturer develops collecting machines and methods adapted for farm use, it is borne in mind that possible industrial use and eventually greater industrial use is involved, development will proceed in the right direction. Industry will not pay more for agricultural residues than for its present raw materials, and because residues are for the most part new to industry, it will probably pay somewhat less. With efficient collection methods the farmer can receive a reasonable cash profit for a portion of his annual residue crop and industry can use these materials also at a profit.